

Established 1835.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

An Illustrated Record of Mining, Metallurgical, Railway, Financial, Industrial, And Engineering Progress.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper and for Transmission Abroad.]

No. 3175—VOL. LXVI.

London, Saturday, June 27, 1896.

PRICE..... SIXPENCE.
BY POST, 2d 4s. PER ANNUM.

A. CORNFORTH AND CO.,
STOCK BROKERS AND MINING SHARE DEALERS,
15, NEW BROAD STREET, LONDON, E.C.

BUSINESS IN ALL CLASSES OF STOCKS AND SHARES.—
SPECIAL BUSINESS in KAFFIR, WEST AUSTRALIAN
and all Mining Shares. Prompt Delivery made a special feature.
Mining Circular free on application.

BANKERS: CITY BANK.—Telegraphic Address: "Athelney, London."

ASSAY OFFICE AND LABORATORY.

B. KITTO'S,
30 and 31, ST. SWITHIN'S LANE, LONDON, E.C.

ASSAYS MADE OF ALL ORES. ANALYSES.
ASSAYING TAUGHT.

MINERAL PROSPECTING

AND
BORINGS FOR WELLS.

Large Experience. Quick Speed. Work Guaranteed.
APPLY TO

VIVIAN'S BORING & EXPLORATION CO.,
(LIMITED)

WHITEHAVEN

Deepest Borehole in England (3195 feet) put down by this Company
who have completed about 56 miles of boring.

Telegraphic Address: "DIAMOND, WHITEHAVEN."

PUMPING MACHINERY.

See Illustrated Advertisement on Page 828.

HATHORN, DAVEY and CO., LEEDS.

CANNOCK CHASE COAL BY CANAL
AND RAILWAY.

THE COMPANY SEND COAL BY RAILWAY in Trucks to all
Stations, and load Canal Boats at their extensive Wharves on the
Inglesley Branch of the Birmingham Canal, adjoining the Colliery
and also at Hednesford Basin, Cannock. For Prices, apply to

J. NEWLAND BROWN,
WARWICK CHAMBERS, CORPORATION STREET,
BIRMINGHAM.

Mail Department: COLMORE CHAMBERS, 1, NEWHALL ST., Birmingham.
London Office: 9 and 10, Southampton Street, High Holborn, W.C.

GOLD ASSAYING, &c.

GENTLEMEN having only a short time at their disposal can
obtain SPECIAL INSTRUCTION in ASSAYING ORES of all
kinds.

For Prospectives, &c., apply to

MARTIN and PETHYBRIDGE,
ASSAYERS, &c., LABORATORY AND TESTING WORKS,
183, KING'S ROAD, CHELSEA, S.W.

Complete Analysis of Constituents of any Ore from £1 1s. to £2 2s.
GOLD ASSAYS CONDUCTED WITH CHECK, 7s. 6d. PER SAMPLE.
GOLD ORES PRACTICALLY TESTED BY STAMP BATTERY
And other processes.

BARTON, SONS, & HEWER,

Mining Engineers, Metallurgists, and General Accountants,
14, CASTLEBREAM STREET, SYDNEY, N.S.W., & COOLGARDIE, W.A.

All kinds of Mining Engineering undertaken and carried out under
the supervision of one of the Firm.

Mines and Mining Properties in all Australia visited, inspected,
and reported upon.

Machinery purchased, inspected, or advised upon.

The Firm will act as Consulting and Advising Engineers in all
matters connected with the Working or Treatment of Ores;

will undertake the Management of Mines, the Erection of
Machinery, either during development or otherwise, or will
take the Legal Management either as Agents, or under a
Board of Directors.

Analyses or Chemical Analysis made or Practical Results obtained
by our Metallurgical Staff.

Using Books of Account opened, kept, and audited; Estates
liquidated, and all the Business of General Accountants and
Agents conducted.

The Financial and General Management will be under the super-
vision of Mr. RUSSEL BARTON, for 16 years Chairman and
Visiting Director of the Great Cobar and Nyngagee Copper and
other Mines in N.S.W.

The Engineering and Metallurgical Department will be conducted
by Mr. W. W. BARTON, Mining Engineer, Graduate of Freiberg,
and Engineer and Manager for many years in New South Wales.

The Survey and Drafting Department will be supervised by
Mr. A. J. C. BARTON, for nine years in the Survey Department
of New South Wales.

The Accountant's Department will be under the personal conduct of
Mr. G. HEWER, Chartered Accountant.

Address in London—Messrs. DANGAR, GRANT, and Co., Fenchurch House,
Fenchurch Street, E.C.; GEORGE HARDIE, Esq., 63, New Broad
Street, E.C.

Telegraphic Address: "Sydney, Lee." "Coolgardie, Pickwick." Code—Bedford McNeill's.

J. GRANT MACLEAN,
STOCK AND SHARE BROKER, STIRLING, N.B.
TELEGRAPHIC ADDRESS—"BONDING, STIRLING."

Clients supplied gratis with Price Lists and Prospectuses explaining
the whole system of dealing in Shares.
REFERENCES ON APPLICATION

GEORGE GREGORY AND CO.,
STOCK AND SHARE DEALERS,
LONDON, MANCHESTER, LIVERPOOL, BRIGHTON, HASTINGS.

Every Investor and Speculator, before operating, should read
Gregory's "Hints to Speculators," 420 pages, Ninth Edition,
Illustrated. Gratis and post free on application to

GEORGE GREGORY & CO.,
STOCK AND SHARE DEALERS,
HEAD OFFICES:
NOS. 3 AND 4, TOKENHOUSE BUILDINGS, LOTHBURY, BANK OF
ENGLAND, LONDON, E.C., and BRANCHES.

ASSAY OFFICE AND ORE TESTING WORKS.

JOHN D. WARREN,
(Late HERBERT R EDMANDS)
BERKLEY GROVE WORKS,
BERKLEY ROAD, CHALK FARM, N.W.
Gold and Silver Assays, 7s. Cyanide, Amalgamation,
Chlorination, or Concentration Tests, including Assays, £1 each.
Assays made of all Ores.

ALBERT H. HALDER,
Consulting Engineer, F.R. B.A., Memb. Fed. Inst. M.E.,
Memb. Am. Inst. M.E., Memb. Austrian Inst. C.E., and Archts.
GENERAL MANAGER,
LEECHDALE (Rhodesia) DEV. CO. LTD.
REPRESENTATIVE CIVIL ENG. EXPL. SYND.
5, COPTHALL BUILDINGS, LONDON, E.C.

Telegraphic Address: "HALDER," Buluwayo
Postal Address: P.O. Box 126, Buluwayo.

MINING BUSINESS MATTERS:
A.B.C. Code, Fourth Edition: Bedford McNeill; Moreing and Neal.
OFFICES:
JOHANNESBURG, LONDON, and PARIS.

W. PELLEW HARVEY,
F.C.S., M.Fed.Inst.M.E.,
MINING ENGINEER AND METALLURGICAL CHEMIST,
VANCOUVER, BRITISH COLUMBIA.
Use A.B.C. and Moreing and Neal's Codes. Cable:—"Analysis," Vancouver,
Canada.
Government Examiner under the Bureau of Mines' Act.
Canadian Agent of the Cassel Gold Extracting Company (Limited), Glasgow.
Five Years in British Columbia, and for several years at Swansea and Redruth.
Information supplied to Syndicates at moderate terms.

E. HENRY DAVIES, F.G.S.,
CONSULTING MINING ENGINEER,
6, GREAT WINCHESTER STREET, LONDON, E.C.,
Author of "Machinery for Metalliferous Mines,"
Joint Author of "Metalliferous Mines and Mining."
"Earthy and other Minerals and Mining."

Undertakes the INSPECTION and MANAGEMENT of MINES at home and
abroad, and the introduction of approved Properties to Capitalists.
Minerals of all descriptions purchased in large or small quantities.

BRITISH GUIANA AND THE NEW GOLD
INDUSTRY.

BRITISH GUIANA BANK.
Incorporated by Ordinance of the Governor and Court of Policy of British
Guiana 11th November, 1838.

Confirmed by the Queen in Council, 6th October, 1838.

SUBSCRIBED CAPITAL..... \$1,400,000 | PAID-UP..... \$926,520

RESERVE FUND, \$288,000

CHAIRMAN: Mr. HUGH SPROSTON, JUN.

HEAD OFFICE: GEORGETOWN, DEMERARA.

MANAGER: GEO. W. LANE. | ACCOUNTANT: F. A. CONYERS JUN

BRANCH OFFICE: NEW AMSTERDAM, BERBICE,

London..... Smith, Payne, and Smiths.

New York..... Maitland, Phelps, and Co.

British North America Bank of British North America.

Newfoundland Bank of Nova Scotia, St. John's.

Current Accounts opened in accordance with the usual practice of Bankers.

Money Received on Deposit on Interest. Bills of Exchange negotiated.

Letters of Credit issued by London Agents on Demerara free of charge.

Raw Gold Purchased or Shipped on Consignment.

Bills Collected and every other description of Banking Business transacted.

THE BANK OF AFRICA (LIMITED).

ESTABLISHED 1879.

Head Office, 113, Cannon Street, London.

SUBSCRIBED CAPITAL £1,675,000

Paid-up, £525,000; Reserve Fund, £287,500

General Manager—JAMES SIMPSON, Cape Town.

BRANCHES

Allwal North, Cape Town, Cradock, East London, Grahamstown, Kimberley

King Williams Town, Oudtshoorn, Paarl, Fort Elizabeth, Queen's Town

Bethlehem, Bloemfontein, Fauresmith, Harrismith, Ladybrand, Winburg

Durban, Newcastle, Pietermaritzburg, Barberton, Johannesburg, Klipdrift,

Dorp, Pretoria Vryheid, Beira, Delagoa Bay, Bulawayo, Salisbury.

The Bank issues drafts, makes telegraphic remittances, buys and collects bills

and conducts all kinds of banking business.

Deposits received on terms which may be ascertained on application.

R. G. DAVIS, Secretary.

R. C. CAMPBELL-JOHNSTON.
(OF SWANSEA, INDIA, AND THE STATES).

FOUR YEARS IN BRITISH COLUMBIA.

MINING ENGINEER AND METALLURGIST
POSTAL ADDRESS: BOX 40, VANCOUVER, B.C.
CABLE ADDRESS: CAMPBELL-JOHNSTON, VANCOUVER.

A.B.C. CODE.
MINES EXAMINED AND REPORTED ON, DEVELOPED
AND MANAGED.

Furnaces, Mills, and Mining Plants Planned and Erected.

ORES BOUGHT AND SOLD.

CHARLETON AND CO.,
A. G. CHARLETON, A.R.S.M., F. W. GREY, A.R.S.M.,
MINING ENGINEERS AND MINE MANAGERS,

undertake Inspections and Reports and the Design of Mining and
Milling Plant of all kinds.

Dashwood House, 9, New Broad Street, E.C.

Cable Address: "Ingratio." Bedford McNeill's and Bromhall's Codes.

JAMES H. HACKET, Mining Engineer,
Is PREPARED to INSPECT and REPORT on MINING
PROPERTIES in WESTERN AUSTRALIA.

Address: J. H. HACKET,
Telegraph Office, Kurnelpie, Western Australia.

DONALD CLARK, B.C.E., M.E.,
BAIRNSDALE, VICTORIA.

Director of the North Gippsland School of Mines (which has the
most perfect Gold-testing Machinery in Australia),

REPORTS ON MINES AND MINING PROPERTIES.

Gippsland a Speciality.

HERBERT T. MARKS, M.I.M.E.,
Consulting Mining and Metallurgical Engineer.
(Late) Mining Engineer and Assayer to the Transvaal Government
Surveys, Plans, Assays, Reports on Mineral Properties Executed.

Erection of Mining and Metallurgical Machinery Undertaken.

Syndicates Represented.

HIGHEST REFERENCES.

May be consulted by Shareholders and Intending Investors in South African
Mining Properties.

New Broad Street House, London, E.C., and

17 and 18, Goodman's Buildings, Johannesburg.

Telegraphic Address: "Topazite," London. "Moorit," Johannesburg.

PUMPS AND PUMPING
MACHINERY.

SEE ILLUSTRATED ADVERTISEMENT (PAGE 811).

JOSEPH EVANS & SONS, Wolverhampton.

J. A. JONES, Mining Engineer,
(M.Inst.M.M., M.N.Eng. Inst.M.E.)

GIJON (ASTURIAS), SPAIN.

COLORADO MINING AND OTHER
INVESTMENTS.

THOMAS TONGE, DENVER, COLORADO.

SPECIALITIES—Gold Properties; Leasing and Development

Syndicates.

CABLE: "TONGE, DENVER." Code, "A. S. C." Fourth Edition.

W. H. ROWE, M.I.M.E.,
MINING ENGINEER.

EARL TERRACE, DOUGLAS, ISLE OF MAN.

Long experience in Dividend Paying Mines, and Undertakes

Inspections and Reports.

Intending Investors furnished with particulars of some good

properties.

APPLEBY'S HANDBOOK of MACHINERY.

By C. J. APPLEBY, M.Inst.C.E.

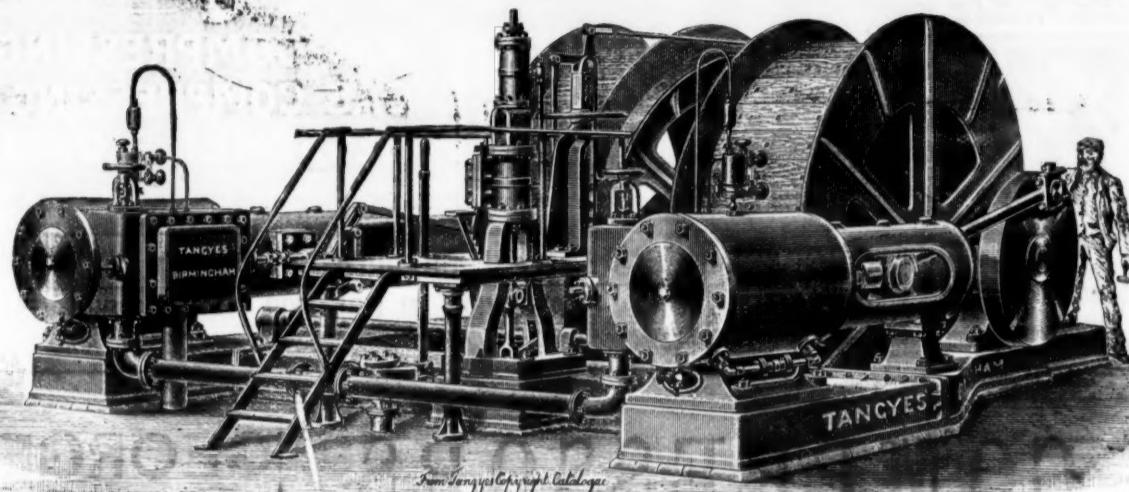
New Edition, entirely re-written, with numerous Illustrations and
Prices. The Sections now relate to (1.) Prime Movers (Engines
Turbines, &c.), (4.) Machine Tools and Accessories (6.) Mining
Colonial, and Manufacturing Machinery. Cloth, 3s. 6d. each Section

MINING MACHINERY separately, cloth, 3s. 6d.

E. and F. N. SPON, 125, Strand, London, W.C.

McNEILL'S
Mining & General TELEGRAPHIC CODE

TANGYES' COUPLED WINDING ENGINES.



From a Drawing of a Pair of Coupled Winding Engines, having Cylinders 18 inches diameter by 36 inches stroke, and fitted with Steam Reversing Gear. Drums 8 feet diameter—one being loose on shaft and fitted with clutch. The whole is carried on a strong Cast Iron Base Plate, in the centre of which is a Wrought Iron Platform for Engineman, the necessary Levers for working the Engines being placed in convenient positions upon the same.

QUOTATIONS ON RECEIPT OF NECESSARY PARTICULARS OF DUTY AND STEAM PRESSURE.

TANGYES LIMITED, Birmingham.

AND AT

London, Newcastle, Manchester, Glasgow, Cardiff, Sydney, Johannesburg, Bilbao and Rotterdam.
Telegrams—TANGYES, BIRMINGHAM.

No. 86c.

JOSEPH EVANS & SONS,

Telegrams:

"EVANS," Wolverhampton.

Write for

"MINING PUMP" Catalogue.

MARK



FOR MINES.

EXTRANEous GEAR.

"EVANS and TONKIN'S" Patent "CORNISH" SINKING PUMPS have been used on all the recent modern sinking operations of importance, including

North's Navigation Collieries, the Blackwall Tunnel, the Barry Dock Extension, the Griff Colliery Sinkings, the Coppice Colliery, the Fishley Colliery, the Moss Hall Colliery, the North Walbottle Colliery, the West Hallam Colliery, and other large Sinkings, also North Wales, Rand, West African, West Australian, Victorian, South American Gold Mines, &c., &c.

London Office
16, UNION COURT, OLD BROAD ST.,
E.C.

DEPOTS:
NEWCASTLE-ON-TYNE,
GLASGOW, WAKEFIELD,
MANCHESTER,
CARDIFF, and BELFAST.

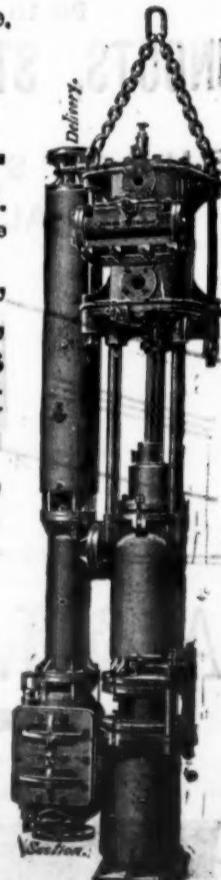
JOHANNESBURG.
Etc.

The "CORNISH" STEAM PUMP.
The "DUPLEX" STEAM PUMP.
The "RAM" STEAM PUMP.
The "RELIABLE" STEAM PUMP.

"DONKEY" PUMPS.
"HORSE" PUMPS.
"POWER" PUMPS.
AIR COMPRESSORS,
&c.



FIG. 875, "FLUOMETER"
PATENT STEAM VACUUM
PUMP.



"STRAIGHT-LINE"
PATTERN
SINKING PUMP.

CULWELL
WORKS,
WOLVERHAMPTON.

GRIFF" PATTERN
"CORNISH"
SINKING PUMP.

WOLVERHAMPTON.

WALKERS' PATENT INDESTRUCTIBLE VENTILATING FANS FOR MINES, TUNNELS, &c. CONSTRUCTORS OF THE VENTILATING MACHINERY AT THE SEVERN AND MERSEY TUNNELS.

Applicable to all enclosed Fans

ANTI-VIBRATION SHUTTER

BROTHERS

WALKER & BROTHERS' PATENT AIR COMPRESSING ENGINES GAS COMPRESSING ENGINES BESSEMER BLOWING ENGINES

upwards of 400 of the above now AT WORK indicating in the aggregate 150,000 Horse-Power

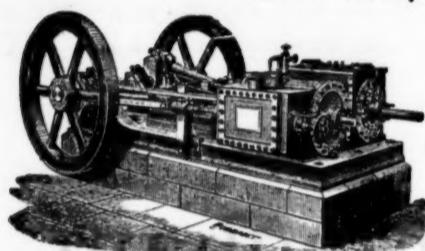
Fisher & Walkers' Patent Friction Clutch & Underground Haulage Machinery

THIS GEARING IS NOW EXTENSIVELY IN USE FOR HAULAGE PURPOSES. **

The objects attained are SIMPLICITY, ENDURANCE OF THE MACHINERY AND ROPES with a MINIMUM EXPENDITURE OF POWER.

AIR COMPRESSORS

With Compound Air and Steam Cylinders,
Fitted with SCHRAM'S Inlet and Outlet Valves giving the greatest efficiency.



SCHRAM'S IMPROVED Rock Boring Machines.

Supplied to the Indian, Colonial, and other Governments.
2500 IN USE in all PARTS of the WORLD.

DIAMOND PROSPECTING DRILLS.

"OPTIMUS" COMPOUND ROCK DRILL.

(P. J. OGLE'S PATENT.)

Consumes 40 per cent. less Compressed Air than any other Drill at the same time giving the most effectual results.

ESTIMATES AND FULL PARTICULARS ON APPLICATION.

RICHARD SCHRAM & CO., 17a, Great George Street, Westminster, S.W.

TELEGRAMS: "SCHRAM, LONDON." A1, A.B.C. and The Engineering Telegraph Codes Used.

GEORGE GREEN, FOUNDRY, ABERYSTWYTH.

SILVER MEDALS AWARDED AT THE ROYAL CORNWALL POLYTECHNIC, 1872 & 1876; GOLD MEDAL AWARDED AT THE GREAT INTERNATIONAL MINING EXHIBITION, CRYSTAL PALACE, 1890.

ONLY AWARDS GIVEN FOR CONCENTRATION PLANTS.

GREEN'S LATEST IMPROVED Self-Acting or Automatic Ore Dressing Machinery.

A Special Plant, on a reduced scale, has been erected at the Works by which samples of METALLIC ORES up to Five Ton may be treated, and the commercial value determined. In this way the most suitable arrangement of Plant is ascertained, a considerable advantage to intending Purchasers of Crushing and Concentrating Plant.

GOLD STAMP AND OTHER MILLS.
Estimates, Catalogues, and Full Particulars on Application.

Telegrams—Green, Foundry, Aberystwyth.

For PURE ALUMINIUM

98 to 99 $\frac{1}{2}$ per cent. (98 per cent. minimum guaranteed) in

INGOTS, STICKS, & ROLLING SLABS;

ALSO FOR
SHEETS, &c., AND
FERRO-ALUMINIUM.

APPLY TO

HENRY R. MERTON & CO.,

2, Metal Exchange Buildings, Leadenhall Avenue.

LONDON, E.C.

AGENTS FOR THE BRITISH ALUMINIUM COMPANY, LIMITED.

A. & J. STEWART and CLYDESDALE, Limited.

Glasgow, Coatbridge, and Mossend.

WROUGHT IRON WELDED TUBES and FITTINGS for GAS, WATER, and STEAM.

Light Lap-welded Wrought-iron and Steel Tubes

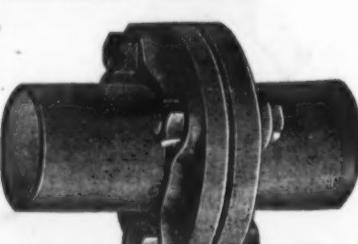
(SPECIALLY ADAPTED FOR MINES).

With Patent Flanged Joints (as illustrated) for the Conveyance of Water, Steam, and Air, at High and Low Pressures.

LAP-WELDED IRON AND STEEL BOILER TUBES
FOR LOCOMOTIVE, MARINE, AND OTHER MULTITUBULAR BOILERS.

STEEL & IRON PLATES FOR BOILERS, BRIDGES, &c.

SECTION OF PATENT FLANGED JOINT



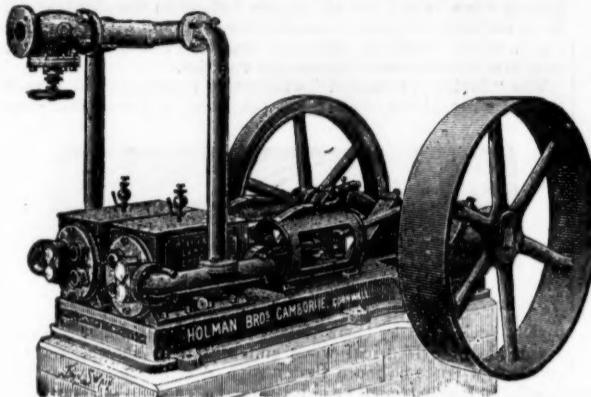
PLAN OF PATENT FLANGED JOINT.

Head Offices: 41, OSWALD STREET, GLASGOW.

HOLMAN Bros., Camborne, Cornwall.

ESTABLISHED 1839.

**Patentees and Sole Makers of
"THE CORNISH" ROCK DRILL and "THE CORNISH" COMPRESSOR.**



RECORD OF WORK DONE

At Botallack Mine, St. Just, Cornwall, TWELVE MEN with TWO new Patent C^ORNISH ROCK DRILLS drove, sunk, and rose 288 FATHOMS in 12 MONTHS, equal to five times the Speed of Hand Labour

At Wheal Grenville Mine, Camborne, Cornwall, SIX MEN with TWO new Patent C^ORNISH ROCK DRILLS started from the 150 FATHOMS level and put up in EIGHT MONTHS a 11 FEET by 5 FEET PERPENDICULAR RISE 46 FATHOMS 5 FEET 6 INCHES, and about midway drove 1 FATHOM 5 FT. No communication of any kind was effected until hoisting to the Shaft brought down from surface.

Estimates for ROCK BORING PLANT and GENERAL MINING MACHINERY on Application.

London Offices: 7 and 9, LEADENHALL BUILDINGS, E.C.

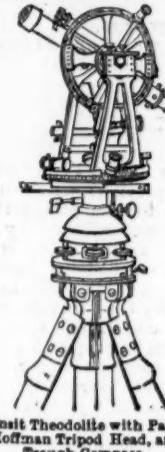
FIRST
SILVER MEDAL,
Highest Award,
Mining Institute
Contest, 1881.
Three Makers
represented.



FIRST
SILVER MEDAL
Highest Award,
Royal Cornwall
Polytechnic
Jubilee Exhibition
Contest, 1882.
Five Makers
represented.

AWARDED SILVER MEDAL INTERNATIONAL
INVENTIONS EXHIBITION, 1885.

JOHN DAVIS AND SON.
ALL SAINTS WORKS, DERBY;
118, NEWGATE STREET, LONDON.



Davis's Improved Hedley Dial, with
Telescope and Sights Interchangeable
and Patent Hoffman Tripod Head

Transit Theodolite with Patent
Hoffman Tripod Head, and
Trough Compass.

Dumpy Level with
Hoffman Patent Tripod Head.

**MINING, SURVEYING, AND
ENGINEERING INSTRUMENTS**

THEODOLITES. LEVELS. TACHEOMETERS.

Davis's Improved Hedley Miners' Dials, with
HOFFMAN PATENT TRIPOD HEAD;
AND ALL DESCRIPTIONS OF MATHEMATICAL AND
MINING SURVEYING INSTRUMENTS.

Revised Illustrated Catalogues Free to any Part of the World.
SECTION (A) MATHEMATICAL DEPARTMENT AND SAFETY LAMPS
SECTION (B) ELECTRICAL DEPARTMENT.

Gold Medal Awarded Mining Exhibition, 1890.
A. B. C. CABLE CODE, 4TH EDITION.

Jeffrey Electric Coal Cutter and Mill may be seen at work in the
Model Mine, Cardiff Exhibition, Instruments, &c., Stand No. 315.

AWARDS: CRYSTAL PALACE, 1890; TASMANIA, 1891; KIMBERLEY, 1892.

CONCENTRATION.

The Clarkson-Stanfield Ore Reduction Co. (Limited).

In the CLARKSON-STANFIELD process of Concentrating Refractory and Complex Ores no water is required; dust is reduced to a minimum; the loss of Mineral through water-borne Slimes is obviated.

OUTPUT $\frac{1}{2}$ TO 2 TONS PER HOUR, ACCORDING TO SIZE OF MACHINE.
CONCENTRATOR TO BE SEEN IN OPERATION AT THE COMPANY'S ONLY ADDRESS.

6, COLONIAL AVENUE, MINORIES, LONDON, E.

The Machine is superior to Sieves for Sizing Homogeneous Substances, such as Emery, Sand, and Powders, and may be used to great advantage in the preparation of Ochre.

N.B.—The owners of the Carndochan Mine, near Bala, North Wales, will, by arrangement, show their CLARKSON-STANFIELD plant working on a Refractory Low Grade Gold Ore.

NEW PATENTS.

LIST of APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs Rayner and Company, Patent Agents, 27, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

- 12542 George Joseph Nicolas Carpenter, 322, High Holborn, London.—Safety devices for steam boilers.—June 8.
- 12591 Joseph Basceres Torres, 17, St. Anne's Court, Wardour Street, London.—Improvements in and connected with the treatment of gold and other ores and in apparatus therefor.
- 12633 James Arthur Drake, 115, Cannon Street, London.—Improvements in oil or gas engines.
- 12657 Henry Edward Newton, 6, Bream's Buildings, Chancery Lane, London.—Improvements in steam pumps.
- 10689 Henry Clifford and William Balnes, 111, Hatton Garden, London.—Improvements in explosion engines.
- 12718 Henri Mari Leon Crown, 8, Chancery Lane, London.—Improvements in motive power engines driven by gas or inflammable vapour.
- 12825 George John Altham, 4, Lincoln's Inn Fields, London.—Improvements in oil engines.
- 12822 John Gibson Whittles, Samuel Hubbard Ogden, and Shatto Douglas, 70, Market Street, Manchester.—Improvements in rotary engines.
- 12867 David Hughes Williams, 1, Furnival Street, Holborn, London.—Improvements relating to the valve gear for steam, air, and other engines.
- 12843 Walter Rowbotham, 27, Vittoria Street, Birmingham.—Improvements in gas generating apparatus for explosion engines.
- 13009 Thomas Dawson and John Peel, 8, Quality Court, Chancery Lane, London.—Improvements in and connected with miners safety lamps.

SPECIFICATIONS PUBLISHED.

10990, Bohmfield, steam boilers; 11781, Dyer, steam boilers; 1,037, Taylor, steam generator; 2041, Von Grubinck, steam engines; 6335, Matheson, steam generators; 8048, Strauss, steam boiler and furnaces; 17473, Davis, steam generators.

The above specifications published may be had of Messrs. Rayner and Co., 27, Chancery Lane, London, at 10d. each, including postage.

New Coolgardie Gold Exploration and Finance Association (Limited).—Registered June 12 by J. B. Purchase, 11, Queen Victoria Street, E.C. Capital £50,000, in 10s. shares. Objects: To adopt and carry into effect an agreement expressed to be made between W. Moffin of the first part, and this company of the other part; to carry on the general business of exploring, prospecting, mining, and trading in Western Australia; and further to acquire any mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous lands, &c.; to develop and turn to account the same in such manner as the company shall see fit; and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches. To construct, maintain, and work rail and tram roads, piers, wharves, docks, warehouses, &c.; to develop the resources of such land, estates, &c., as may from time to time be acquired by the company by clearing, draining, farming, planting and building thereon, as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c. The first directors—of whom there shall be not less than two nor more than five—are to be elected by the signatories. Qualification £20. Remuneration £270 per annum each, and a percentage of the profits divisible.

Antimony Gold and Complex Ores Reduction Company (Limited).—Registered June 12 by W. H. Martin and Co., 15, King Street, Guindal, E.C. Capital £350,000, in shares of £1 each. Objects: Primarily, to adopt and carry into effect an agreement expressed to be made between J. Woolford and G. Willis of the first and second parts, and this company of the third part; and further to acquire any mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous lands, &c., to develop and turn to account the same in such manner as the company shall see fit; and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches; to construct, maintain, and work rail and tram roads, piers, wharves, docks, warehouses, &c.; to develop the resources of such lands, estates, &c., as may from time to time be acquired by the company by clearing, draining, farming, planting and building thereon, as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c. The first directors—of whom there shall be not less than two nor more than seven—are to be elected by the signatories. Qualification £250. Remuneration £350 per annum each (Chairman £60) with a percentage of the profits, divisible. Registered office, 34, Blomfield House, London Wall, E.C.

Gold Fields of Mexico (Limited).—Registered June 15 by Jordan and Sons (Limited), 120, Chancery Lane, W.C. Capital £100,000, in shares of £1 each, of which 100 are described as "adventures' shares." Objects: To acquire the benefit of two bonds—each bearing date April 7, 1895—from Senor Don Martin Salido (father and son), to acquire mines, mining rights, &c., in Mexico; and to develop and turn to account the same in such manner as the company shall see fit; and further to acquire any other mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous lands, &c., to develop and turn to account the same in such manner as the company shall see fit, and further to acquire any other mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous lands, &c., to develop and turn to account the same in such manner as the company shall see fit, and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches. To construct, maintain, and work rail and tram roads, piers, wharves, docks, and warehouses; to develop the resources of such lands, estates, &c., as may from time to time be acquired by the company by clearing, draining, farming, planting and building thereon, as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c.

Mount Orient Gold Mining Company (Limited).—Registered June 15 by Hepworth and Company, 15, Smith Street, Finsbury, Capital £150,000 in £1 shares. Objects: To adopt and carry into effect an agreement made June 15 between Alexander John Miller and Thomas Rowan of the one part and S. H. Johnston, on behalf of this company, of the other part, for the acquisition of certain gold mining leases known respectively as the "Shouldn't Wonder," the "H. and H.," and the "H. and H. Extended," the same being situated in the Ovens Valley in the mining district of Beechworth, in the colony of Victoria; to develop and turn to account the said properties in such manner as the company shall see fit, and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches. To construct, maintain, and work rail and tram roads, piers, wharves, docks, warehouses, &c.; to develop the resources of such vast estates, &c., as may from time to time be acquired by the company by clearing, draining, farming, planting and building thereon; as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c.

Golden Valley Mines of Western Australia (Limited).—Registered June 12 by Rose, Innes, Son, and Orick, Billiter Square, E.C. Capital £150,000, in £1 shares. Objects: To adopt and carry into effect an agreement expressed to be made between the London and Coolgardie Explorers (Limited) of the one part, and this company of the other part; to acquire gold mines, mining rights, &c., in West Australia; to develop, work, and turn to account

the same in such manner as the company shall see fit; and, further, to acquire any other mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous land, &c., to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches; to construct, maintain and work rail and tramroads, piers, wharves, docks, warehouses, &c.; to develop the resources of such lands, estates, &c., as may from time to time be required by the company by clearing, draining, farming, planting and building thereon, as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c.

CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

* We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract price should be given.

The date given is that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such the name of "The Mining Journal" should be mentioned as the original source of the information, concerning which further particulars are required.

HOME CONTRACTS.

Engine and Boilers June 29 (Upholland).—For duplicate pumping engines and boilers for the Upholland Urban District Council. For particulars apply to Messrs. Heaton, Riplin, and Heaton, engineers and surveyors, Wigan. Sealed tenders endorsed to be delivered to Mr. Jas. Bassett, clerk to the Council, Upholland, near Wigan, not later than 12 noon on the 29th inst.

Pumps, June 30 (Wiesloch, Germany).—For the supply of engine and pump for the waterworks. Application to the local authority at Wiesloch.

Iron Bars, July 1 (Brussels).—For the supply of furnace bars to the Belgian Government for use in the Ostend steamer. Particulars at the Brussels Bourse.

Excavating, July 3 (Ilkeston).—For the excavation and ballasting required to be done preparatory to the laying down of running lines and extensive sidings at the colliery, for the Manners Colliery Company, Ilkeston. Specification, plans, and sections may be seen at the offices of the company any afternoon. About 40,000 cubic yards of earth have to be removed and 11,000 superficial yards of ballasting done.

Rails and Sleepers, July 4 (Cairns).—For the supply of 1200 tons of railway rails, with their usual accessories, and 24,000 wooden sleepers, for the Daintree Canal. Application to the Administration Centrale de la Daire, Sanish, Oaire, and specifications also obtainable at Alexandria.

Iron Fencing, July 6 (Derby).—For iron fencing to Markeaton Recreation Ground, for the Corporation. Plan can be seen, and specification and form of tender obtained on application at the offices of the Borough Engineer, Babbington Lane. Tenders to be sent to Mr. H. F. Gadsby, Town Clerk, Town Hall, Derby.

Coal, July 6 (London, N.).—For the supply of coal and coke for a period of one year from the 24th inst., for the Hornsey Urban District Council. Particulars and forms of tender can be had on application to Mr. M. J. Lovagro, C.E., engineer to the Council, any morning before 12 noon at his office at Southwood Lane, Highgate, N.

Ironwork, July 15 (Alexandria).—The Administration of Harbours and Lighthouses wants tenders for a condenser, 34 cast iron columns, 38 dredger buckets, some corrugated galvanised iron roofing, a vertical boiler and fittings, three anchors, &c.

Gas Coal (Kingston).—For the supply, during 12 months from the 25th inst., of from 400 to 500 tons of best screened gas coal in quantities and at times to suit requirements, for the Kingston Gas Company. Tenders to be forwarded to Messrs. Temple and Philip, solicitors, Kingston, Herefordshire.

JOINT-STOCK COMPANIES.

NEW REGISTRATIONS.

THE following are among the joint-stock companies registered at Somers House since our last notice:—

Vale of Coolgardie Gold Mines (Limited).—Registered June 15 by Phillips, Cumming, and Mason, 14, Sherborne Lane, E.C. Capital £30,000, in £1 shares. Objects: To acquire the gold mine or mining property called New Victoria, situated near Mount Burgess, to the North of Coolgardie, West Australia, belonging to the New Australian Company (Limited) upon terms of an agreement expressed to be made between the New Australian Company (Limited) of the first part, and this company of the other part, and further to acquire any other mines, mining, water, and other rights, grants, leases, claims, concessions, options of purchase, metalliferous land, &c., to develop and turn into account the same in such manner as the company shall see fit, and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches. To construct, maintain, and work rail and tram roads, piers, wharves, docks, warehouses, &c., to develop the resources of such lands, estates, &c., as may from time to time be required by the company by clearing, draining, farming, planting, and building thereon, as builders and contractors, farmers and graziers, stock raisers, shipowners, storekeepers, &c.

WIRE MINING ROPES.

THEIR TECHNOLOGY, MANUFACTURE, AND USES.

By J. BUCKNALL-SMITH, C.E.,
Author of "Wire: its Manufacture and Uses;" "Underground Ropes Haulage;" "Cable Traction for Rail and Tramways," &c.No. IV.
(Continued from page 782.)

RESUMING our investigations of the "Albert laid" ropes, described and illustrated in the previous article under the above title, we will proceed to give some further particulars of some satisfactory performances achieved by this construction, which have come under the writer's notice in the course of professional inspections. In some colliery shafts in this country this type of roping may be found in excellent condition after fully two years of exceptionally hard service—e.g., after having raised some 500,000 tons of coal at high speeds of winding. Some bottom, or "underside," winding ropes have done duty for two years and six months in continuous operation. The average sizes of these ropes may be given as from 3½ inches to 4½ inches in circumference, and composed of "plough" steel wires of good uniform qualities. At a colliery in Normanton one of these ropes was at work for just on three years, raising 1500 tons per day, at a speed of some 18,000 miles per annum. It was a plough steel rope of 1½ inch in diameter and 500 yards in length. The winding drum was 18 feet in diameter. Underground haulage ropes of the type in question have been in constant service, under severe conditions, for some two years and four months, running at an average speed of 12 miles an hour, with a load of 19 tons to each set worked on the "main and tail rope system." Similarly, such ropes have been in operation on some of the North-Eastern Railway Company's gravitation inclines in Durham for over three years' continuous service, lowering about 5000 tons of coal daily. One of these ropes which the writer inspected had lowered 3,400,000 tons of fuel, and still appeared to be in very fair condition. These ropes are exposed to all kinds of weather and other trying influences. In pumping operations a similar type of rope had raised some 1,500,000 tons of water a distance exceeding 225,000 miles. At the Upleatham Ironstone Mines, one of these ropes ran for 1640 days (over 4½ years), and hauled 830,000 tons of ore. At a Staffordshire colliery such a rope was employed for winding operations in a wet shaft for nearly four years, or until it had raised some 2,650,000 tons of coal. Referring to endless underground haulage, ropes of the type at issue have been most satisfactorily employed in numerous workings all over the world. At the Clifton Colliery, ropes of ½ inch diameter, composed of plough steel wires of 13 gauge have been employed, some running for some six to four years before being taken off. These ropes are some 4000 yards in length; the road presents a gradient of 1 in 10 on a curve of 5 chains radius. About 65 tons, or 80 tubs of 16 cwt. each, are commonly hauled upon this system of underground transportation. At some parts, the inclination attains 1 in 4. The driving drums are 6 to 7 feet in diameter, but the speed of haulage is only about 3 miles an hour. The total cost of haulage here averages about 1·5d. per ton mile. As an example of the behaviour of the rope under more severe conditions of haulage, we may cite a case recently brought to our notice of its excellent performances on the Melbourne Street Cable Railways. The rope in point ran 94 weeks and 3 days, at an average speed of 10 miles an hour, or 120,108 miles, before it was removed to another part of the system where lighter traffic prevailed. This cable was 19,500 feet long, in one continuous piece, and 3½ inches in circumference; it weighed 20 tons. It was manufactured by Messrs. Bullivant and Co. The curves and gradients at some parts of this tramway system are severe, whilst the full loaded cars weigh some 5 tons each.

Mining engineers should keep accurate accounts of the detail performances of their ropes, for purposes of comparison and computing their costs per unit of duty effected—i.e., when put to work and taken off; exact conditions prevailing; speed at which run; total of tons hauled or raised, &c.

In the case of winding ropes to be used in vertical shafts, or those of steep inclination, or to be employed for haulage over severe gradients, a factor of safety of 10 is advisable and usual—i.e., a margin of strength allowed up to 10 times the maximum theoretical breaking strain required to be withstood. The method of computing the collective strength of the individual component wires of any ropes, in tons per square inch of section, has been previously explained, but manufacturers usually supply in their catalogues tabulations of the breaking strengths of the different sized ropes they are prepared to supply. Purchasers should, however, further obtain a guarantee from the maker that the strengths set forth can be corroborated by actual tests, for in some instances such tables have proved unreliable in practice; besides, so much depends upon the uniform selection of a given standard of wire and the excellence of its manufacture. The properties of a coil of wire may vary throughout its length, hence it is advisable to test each end of the "hank" or bundle before deciding upon its uniformity of quality. No form of calculations should be allowed to supersede the value of practical tests applied to wire and ropes. Here let us pause to briefly examine a few good examples of the details of construction observed in some typical forms of modern "Albert laid" ropes:—

Sizes of circumference in inches.	No. of strands	No. of wires in strands.	No. of wires in core.	Gauge of wires, inches.	Lay of strands, inches.	Lay of ropes, inches.	Approx. breaking strain of ropes in tons per square inch, or twice steel.	Approx. weight per fathom, lbs.
2	6	6	1	.072	2½	6	13·	41·
3	6	6	1	.105	3	7	31·	84·
4	6	8	7	.116	3½	9	56	16·
5	6	10	7	.146	4½	13	90·	33·

Here the wire is assumed to be of a good quality of "patent" or "improved" cast steel; if "plough" steel be used the breaking strength would be higher—for example, a rope 2 inches in circumference of similar construction could present an ultimate resistance in that case of about 18 tons instead of 16 tons, as above set forth.

With reference to the above tabulated practice, it will be seen that the proportions which the lays in the strands and ropes bear to the diameters of the latter, range from about three and a-half to two and a-half, and six and a-half to nine times respectively. Harder qualities of steel may be safely used in the construction of Albert laid ropes than in those of the common form. A reasonable price for the above class of ropes

may range from 40s. to 60s. per cwt., according to the gauge and quality of wire employed in their manufacture.

Reverting to the importance of using wire of uniform qualities and tempers in any one rope, the following example may be given of some excellent rope wire which came under the writer's notice not long since. For brevity, we will confine our attention to the wire .072 inch diameter or gauge, similar to that used in the production of the 2 inch rope first defined in the above table. This wire in point was drawn from some Siemens-Martin steel rods supplied by the Steel Company of Scotland. The figures given are the results of practical machine test*, and both ends of the coil were similarly tested.

GAUGE OF WIRE, .072 INCHES.

Front end of Coil.		Back end of Coil.	
Number of twists in 8 inch lengths.	Tensile resistance in lbs.	Number of twists.	Resistance in lbs.
Torsion.	Lbs.	Torsion.	Lbs.
47	725	46	740
49	730	45	756
48	733	47	750
48	730	46	742
46	738	45	755
47	727	46	745
48	730	46	743
48	739	47	735
46	728	45	750
47	734	46	745

The percentage of elongation in these wires, before rupture, averaged 2 per cent. From such a satisfactory batch of wire, a proper or uniform selection of wire was not a difficult or lengthy task. These machine tests show at a glance the properties of the wire under investigation.



FIG. 4.

The accompanying illustration (Fig. 4) represents a side elevation of a most efficient and powerful hydraulic rope-testing machine, as installed upon the model premises of Messrs. Bullivant and Co. This useful piece of apparatus will indicate the ultimate resistance of any piece of roping up to 100 tons, its range or capacity being, therefore, commensurate with any requirements. Apparently no other manufacturers have thought it worth their while to put down such an important piece of plant, the common practice being, when such tests are unavoidable, or demanded by disputes, to send specimens or portions of the rope in question to one of Lloyd's testing houses. Upon reference to our illustration the construction and functions of the machine will be apparent, and need but little explanation. The portion of rope to be tested is secured between the two shackles shown. Power is exerted on the same by the hydraulic engine fixed on one end of the framing, whilst resistance is applied at the opposite end in the form of a weigh-beam or weighted lever of a compound type. The horizontal beam is mounted on a pillar fulcrum, and provided with an adjustable counterweight. At the extremity of the long arm weights may be attached from 1 cwt. to the equivalent of 100 tons. The scale on the beam, traversed by a movable weight, is graduated from 1 cwt. to 5 tons. One shackle is connected to this mechanism by links and a bell crank, whilst the other is attached to the crosshead of the hydraulic ram. The strain at which the specimen breaks is indicated by the sum of the weights applied, plus the reading on the scale beam.

The egregious ideas and fallacies concerning the properties of wire and ropes, as also practical methods of testing in connection with the same, which exist in the minds of some persons who should be better informed, are regrettable and astonishing. Early in 1891 one of Her Majesty's Inspectors of Mines read a paper on these matters before one of the Midland Societies of Engineers, in the course of which he advocated a method of ascertaining the ultimate tensile strength of rope wire, consisting in suspending "a tub at the lower end of the specimen to be tested," into which water was to be "steadily poured until the wire ruptured," an arrangement neither convenient nor practical. Now, steel mining rope wire of .080 gauge may withstand an average strain of over 1200 lbs. and 35 twists, whilst some gauges of plough steel wire (12 or 11 S.W.G.) will resist a tensile strain of over a ton. What sort of a tub is this sage likely to find at a mine to meet his unique requirements? The capacity of a hogshead, 540 lbs., is no use, scarcely more serviceable would prove a butt, 108 gallons or 1080 lbs. The average tensile testing machine is capable of exerting a strain on a single specimen of from 30 cwt. to 2 tons. It may be interesting to recall that the aggregate tension exerted and existing upon the wires of a modern "concert grand" piano is about 20 tons. When expense is no object, music wire is sometimes used in ropes; in this superior class of steel you may have a tensile resistance equal to 150 tons per square inch of section, and yet withstand torsional tests of some 60 twists. In the same paper the "Inspector" tells his readers "steel wire should withstand 20 twists." To what quality, temper, and gauge does this expert refer? We have told our readers that steel wire of different qualities, properties, and sizes (ranging between 80 and 150 tons strength) may resist 40 to 50 twists before rupturing. This and other similar publications bristle with erroneous and misleading statements.

We will now turn our brief attention to some ropes composed of wires or strands of fancy section, and from the offset we may frankly state that in practice they need little concern the

that they are very pliable, do not twist or spin at work, and that they weigh less per unit of length for a given strength than other ropes. On the other hand, they do not tell the user that this rope cannot be spliced; there is no possibility of learning the condition of the interior construction of the same, and that its price is 58s. per cwt. in patent steel and 68s. per cwt. if of "plough" steel. The rope is manufactured by Messrs. George Elliot and Co., of Cardiff. The type illustrated and that chiefly advocated is, as will be seen, a solid construction, but the same principle may be applied to stranded ropes. The cylindrical wire core, the layer of radially fitting wires, and the outer interlocking wires or coil are all clearly defined in the illustration. It is certainly a pretty manufacture, and for some standing ropes, cable sheathing purposes, special winding services, it may have its recommendations and votaries.

The "flattened stranded" wires ropes represented in Figs. 6 and 7 are inventions of the same patentees, and their manufac-



FIG. 6.

ture is carried out by them at Hay Mills, Birmingham. These are made of cylindrical wires and strand as shown, and the production costs no more than a rope of ordinary form. The novelty is the flattened or elliptical construction of the component strands, in lieu of those of circular form. The sections given (Fig. 7) indicate the methods by which the invention is carried into practical effect by spinning wires around an elongated

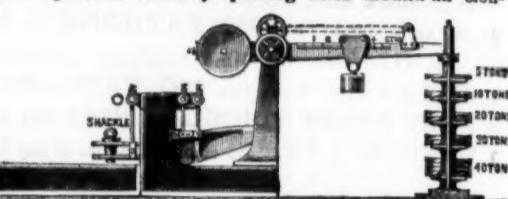


FIG. 4.

wire core, or hearts composed of two or more cylindrical wires or strands. The object of the design is to ensure a greater wearing surface of wire being in continual working contact than in ropes of ordinary construction; a claim which the writer ventures to think exists more in theory than practice. When new, two or more of the external wires may be maintained in peripheral working contact, but after a little wear, the writer fails to appreciate any practical advantages over the ordinary "Lang or Albert" laid rope, and from extensive

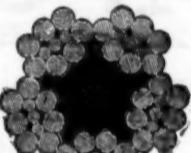


FIG. 7.

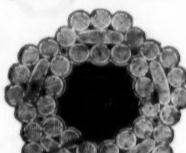


FIG. 7.

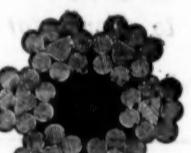


FIG. 7.

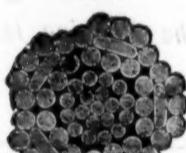


FIG. 7.

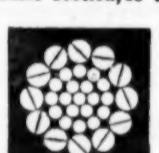


FIG. 8.

enquiries he has not been able to learn of any lives or performances which have exceeded the records or achievements of the old construction specified. In the example given it will be seen that the rope is laid according to the Albert or Lang principle. It is claimed that these elliptical stranded ropes do not spin or kink, and that they can be neatly spliced.

Fig. 8 represents two sections of guide or aerial tramway ropes also according to Messrs. Latch and Batchelor's designs. It will be seen that the strands are composed of two wires of semi-circular section, so that when put together they form a

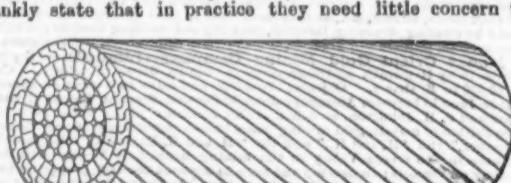


FIG. 5.

average mining engineer. Amongst the most ingenious of these constructions, the designs of Messrs. Latch and Batchelor must be awarded the first place. Their "locked coil" ropes, invented in 1884, and first publicly exhibited at Kensington in 1885, present features of novelty and merit in certain directions. This type of rope is illustrated in Fig. 5. The advantages of this construction will be apparent—viz., a smooth external or working surface, whilst the wires are locked in position, so that when broken they do not "brush out"; it is further claimed

solid cylindrical rod or wire. In the event of a wire breaking, it will not unlatch itself to the extent of an ordinary strand. This construction reminds one of Laidlers' invention, consisting in the employment of wires of sectoral configuration, which are laid radially together to form a solid wire or strand—nothing, however, has been demonstrated or made known as to its practical advantages or applications.

F. W. Scott, of the Reddish Rope Works, devised a simple method of locking the external wires of a rope in position by the aid of clamping strips of metal; this suggestion died a natural death, we believe.

Messrs. Speeding and Craven, of Sunderland, sometime ago took up the manufacture of Westgarth's type of wire rope, which related to rather fine dealings with the "up-take" of wires in strands. It may find an existence with some fiddlers, but it has certainly not "boomed" anywhere, or gained any general recognition for its claimed merits, although as an analytical study in rope making it is interesting. It has been explained that in the manufacture of roping, commonly the wires composing the strands are twisted twice or three times, whilst the strands are given one turn in "closing" them into a rope; therefore, an allowance is made for the difference of length in the wires and strands, or "absorption." According to Westgarth, the amount of twist in the strand and rope is regulated to certain proportions, so that a reduction of torsion in the wires is, he says, effected, whilst the working strains are said to be more in the direction of their axes; further, when the rope is bent it is claimed that the wires "give towards themselves," and not transversely.

Messrs. J. Glover and Co., St. Helens, have advocated the use of a spiral or helical wire core for ropes so as to allow for the expansion and contraction of the strands when under bending stresses. The idea seems reasonable. Whilst touching again upon cores of roping, we repeat that they must be ignored in computing the strength of any rope; they fulfil supporting functions only, and cannot be considered in the tensile efficiency of the combined structure. This will be evident when we remember that the wires and strands follow spiral paths, whilst the cores run straight through the strands and rope.

The Seale construction of ropes has found some favour in the United States, although deficient in certain recognised (theoretical) requirements on this side of the Atlantic. In forming compound strands he arranges the centres of the wires radially with the strand centres, and lays them between the wires of the preceding layer. In this way he obtains a compact and solid construction at the sacrifice of the variable lays usually considered desirable in scientific rope making.

Flat wire ropes are certainly deficient by comparison to those of circular section; but some old driving or winding plant necessitate their employment. They are commonly made by binding together, side by side, four, six, or more round ropes of alternate lays, by hand wire stitching. Flat ropes are now practically obsolete. A well-constructed round rope presents about 85 per cent. of useful efficiency, whilst a flat rope seldom exceeds 65 per cent., thus leaving 20 per cent. in favour of the former type. Further, the wear on flat ropes is more localised, and fully 20 per cent. more than with round ropes. Again, the working tension is more irregular. For a given strength, the weight of a round rope of definite length is less than that required in the case of a flat one, which also works inferiorly over the drums or pulleys. True it is that round ropes have sometimes an objectionable tendency to spin when free at one end; on cranes and hoists it may occur to an almost serious degree, but in mining operations it is seldom of much consequence. Further, such spinning propensity may, in a large measure, be counteracted (by the "lays") in a properly constructed rope. Sometimes the component wires of compound stranded ropes are laid in opposite or alternate directions, in order to neutralise this spinning tendency. In "sinking" operations, in which the kibbles are suspended freely without guides, this twisting action is unquestionably objectionable. In a measure this may be prevented by employing winding pulleys with V-shaped peripheral grooves, which to some extent check the angular reciprocating motion of the rope. When a shaft is completed and guide ropes fitted therein for the cages, any spinning tendency of the winding rope is at once arrested.

Considerable care and judgment should be displayed when socketting or capping the lower end of winding ropes, not only with regard to the security of the union, but also in respect to the treatment of the wires at the rope end. Some distance from the end should be previously bound with "servings" so as to prevent the wires from springing out during or after the operation; in this way, slack, sagging, and irregular tension of the wires may be avoided. Instead of the preliminary "lapping" mentioned the same result may be secured by filling in the end of the rope with white metal, thus forming it into a solid bar for a short distance from its extremity. When the rope end is passed into the socket — preferably of tapering shape—the wires are splayed out, and a wedge-shaped plug of soft metal driven in centrally from the lower end. A solid joint may be then achieved by filling in the socket with white metal. As a precautionary measure, recapping or socketing should be resorted to at comparatively short intervals, as obviously these parts constitute the weakest and most doubtful points in winding ropes.

MINING IN VICTORIA.

(FROM OUR OWN CORRESPONDENT.)

MINING is still being pushed ahead with much vigour in various parts of the colony. The speculators are still busy with Tasmania, promoting Mount Lyell's of all descriptions. Mr. William Knox, who will be better remembered at home as the promoter of the Broken Hill Mine, shortly leaves for England with a group of mines for the London market, eclipsing in magnitude all prior achievements. All the leases belonging to companies or syndicates known as the Curtin-Davis Mines, on the Dundas field, Tasmania, are being amalgamated for flotation under the superintendence of Mr. Knox. This news will raise a cheer from the lips of many a London financial editor who in the past have regarded Mr. Knox's visits to England as objects of their special consideration. In this case let me say that a consensus of expert opinion agrees that the Curtin-Davis Mines are a source of great wealth, and have already made the fortunes of a great number of prominent Victorian speculators. Those who are not in the Lyell boom are attracted to Gippsland, which at present is regarded as the coming gold field. Some rich finds have been made in the Bemm River, both in alluvial and quartz reefs. A rush has set in on the alluvial, in from 6 to 8 feet sinking, yielding from $\frac{1}{2}$ to 2 dwts. per dish. The reefs that have been opened up from surface to 15 feet have so far yielded from 5 to 6 ounces per ton. The ground is being rapidly taken up.

The Röntgen "X" ray photo process, if applicable to many of the mines now being sent to London, would disclose something interesting. Presumably, there must be something to hide when promoters wish their operations kept from the ken of newspapers and the public on this side. With the sound concerns every publicity is given, and the general demand is for such publicity as will enable the *sous-fief* of the mine to be tested before being floated at home. If expert opinion counts for anything, it is only logical to expect that reputable and competent men shall be employed. In a mine brought under my notice, which has been sent home to be floated, the professional expert, who reported on the property, declined to recommend it to English capitalists. I have already warned the promoters that it will be my duty to bring this matter to light in London. The professional expert, acting strictly on etiquette, declined to allow me to see the report, and the promoters say in reply that a too rigid test was resorted to, and no allowance made for "future probabilities."

Not wishing to condemn without the fullest enquiry, I give the result of my examination. The promoters have not worked the mine themselves, and being people altogether outside of the mining industry, have wasted their money on too sanguine a recommendation. Had the matter rested here, there would have been no occasion for comment, but it assumes a different aspect after being told by the very best expert advice in the colony, that in the present stage of developments they have no reasonable basis for seeking the aid of English capital to carry on mining operations on the lease in question. English capitalists need, in this particular case, to obtain an independent report. It is too serious a business to allow bad mines from a good district to go on the market; in a very short time the district gets a bad name, and even if a really good investment is brought forward, it is looked on with suspicion and cannot be got off. Everyone is made to suffer because of a failure and waste of shareholders' money, which with the slightest practical knowledge to judge could have been prevented. On these broad lines the Helmsford claim must be warned off the market. The claim is one of 28 acres, situated 4½ miles from Bradford, on the western slope of a spur of the main dividing range, to the north of Reedy Creek, and on the opposite

side of the range on which the well-known Reedy Creek diggings exist. The Crown Mine, working the Crown and Doyle reefs in that locality, having recently been floated at home, and quite a batch of leases, consisting mostly of new finds on the Langridge and Crown lines of reefs, are also in London for flotation. The ground within the Helmsford lease is very much broken, and the principal work done is on the south portion, consisting of a shaft sunk to a depth of 40 feet, apparently an old one, with a great deal of water in it. The vein, about 2 inches in width, has been stopped out irregularly to about 30 feet. About 20 tons of stone has been taken out. This is reported to have gone 2 ounces 7 dwts. to the ton, but, judging by the blocks left behind, about 15 tons were apparently too poor to work. Some trenching has been done in several places on the lease, but in each case the stone has been left, the inference being that it would not pay to take out. On the north of the ground a short shoot has been worked for about 10 feet in length, and breaks off at both ends. The ground has fallen in, and shows it only to have been worked to a shallow depth. From the nature of the workings, one is forced to the conclusion that the prospectors who abandoned the claim held to the belief that the shoots were too poor and too short to be worked, and as far as an examination of the features go, it is questionable if any other opinion can be arrived at. In the absence of a detailed geological survey, it is impossible to say that the lode here is a continuation of any of the known Reedy Creek lines. No line sufficiently accurate has been taken from Reedy Creek to this ground, and even then it would be most difficult to get a line on account of the main cross range intersecting the country, which, from the reports of those who have prospected the range, is full of cross slides and courses. These, in all probability, have divided the lodes from their regular courses. Beyond being in the same line of direction (*i.e.*, north and south) as Reedy Creek, there are no other reasons for assuming that the outcrops in the Helmsford ground are one and the same reefs now being worked 10 miles distant.

To prove this, cross trenches must be cut from east to west, or a main shaft sunk and a cross drive put in. This is prospective work, requiring a large amount of money, which capitalists have a right to be informed of before they put it into the claim.

With this understanding, everyone would welcome English capital in the Helmsford claim, for there is no reason why other reefs should not be searched for and worked, and with the same good results as the Langridge and Crown reefs have been in the past. As two or three reefs come to the surface east of the Langridge line, which is 300 feet east of the Crown reef and 700 feet east of Doyle's, there is a known band of at least 1000 feet in width, which these lodes traverse.

At one time it was thought gold would not be found north of the slide on either of the Langridge or Crown Mines, but the Crown at the 500 feet level extended their drive clean through the slide and get a well-defined lode below it, giving 9 ounces to the ton. In the Langridge at the 260 feet level the reef formed north of the slide in solid country. The stone was well mineralised, and a little gold was got close to the Sovereign boundary. The thickness of the slide was from 1 to 10 feet, composed of black slate intersected with quartz threads and sandstone bands. It would be a great permanent benefit to the district if a main shaft was sunk on the Helmsford side of the range and a crosscut put in. It would provide a great deal of country which has only been scratched.

Mr. William Bradford, mines and field reporter for the *Ballarat Courier*, and special reporter for the Mines Department on the Ararat Gold Field in 1894, has rendered a substantial service to the mining literature of Victoria by issuing the first of a series on the Ballarat Gold Fields, the result of a detailed examination of all the places where mining had been or was actually being carried on within the area of the rich "Indicator" belt. Its appearance is peculiarly well-timed, when so many claims from the Ballarat district are being placed upon the home market. In referring to developments at deep levels in the mines on the Indicator line, Mr. Bradford states:—"The average depth until very recently did not exceed more than 400 feet. To this level the ground has been only partly worked, and more than £3,000,000 in gold has been won from its quartz. What about the prospects of the line now that the comparatively barren country has been proved to be only a narrow layer, having the usual network of quartz occurrences below it as golden as were found to be the higher marks?" The work gives a description of the mines at Egerton, Gordon, Elaine, Steiglitz, Linton, and Smythe's Creek.

My limit forbids me to follow Mr. Bradford's description in detail, but nothing seems to have been overlooked that could contribute to its completeness or to its usefulness, especially to English capitalists anxious to know something of this great auriferous region and the 60 photo engravings of the principal mines of the district and their milling machinery, in addition to several geological pictures by which it is illustrated, will serve to show that Ballarat mines are laying the foundations of a great and prosperous industry. The author has, apparently, spared no pains to make his book a standard authority on the subject of which it treats, and, doubtless, will form one of the most important memoirs yet published on the Ballarat gold field. It has met with a good reception locally, and stands a very fair chance of meeting with a wider sphere in England. The councils of the city and town of Ballarat have subscribed for a large number of copies for distribution at home, through the Agent-General's office. It is a pity that similar task is not undertaken for the Bendigo and other permanent gold fields in Victoria, for, looking to their future, a glorious prosperity is dawning.

Mr. R. A. Moon, assistant geological surveyor, has been making an underground geological survey at Maldon. In a progress report to the Mines Department he gives a variety of facts which will be read with interest by all interested in quartz mining. With reference to the occurrence of gold shoots in quartz lodes, Mr. Moon says that the pitch of the shoots follows a natural law, and coincides identically with that of the intersection of the lode with an adjacent rock bed. Further, that the pitch is dependent on the relative dips and strikes of the lode and strata, and the angle at which the strike of the lode crosses that of the strata. For these reasons he believed that the gold in the lodes had been transferred thereto from the adjacent strata, and in the case of short or narrow shoots of gold was in all probability derived from an individual rock bed, which if the said supposition can be adopted as a general fact, then the pitch of the auriferous shoot would correspond with the line of intersection of the lode and strata. After patient investigation of a number of veins, in which gold occurred in shoots, Mr. Moon records nine cases in which there was a well-defined difference between the dips and strikes of the reef and strata, which, he states, substantiated in every respect the existence of such a law, and adds that, with reliable data obtainable, the pitch of a possible shoot can be ascertained, and prospecting shafts sunk accordingly, and not at random, as in the present practice. If this view is correct, it is a matter of great importance to our miners. Hundreds, and I might say thousands, of shafts have been sunk in this colony, in places where no reef could ever be found, through a want of some acquaintance with the formation of lodes. In this respect it would be interesting to learn Mr. Moon's opinion of the recommendation of Mr. Muirson, in reporting on the Helmsford claim, to sink a shaft 40 feet away from the outcrop on the south, with a view of striking the lode. I don't know, I may be wrong, but I fancy Mr. Muirson would sink to water before he struck the lode he was after, especially with such dips as exist in the Reedy Creek district.

MESSRS. BARRY, HEAD, AND CO.'S weekly report on the Iron and Steel Market:—Prices remain much as last reported, also the general position. The tendency is certainly upwards, and works are busy, enquiries and orders being much more plentiful.

The directors of the ALADDIN'S LAMP GOLD MINING COMPANY (LIMITED) have declared a further interim dividend of 2s. per share, free of income-tax, payable July 9. The transfer books will be closed from July 1 to July 9 inclusive.

THE WATER DIFFICULTY IN WESTERN AUSTRALIA.

By RAYMOND RADCLIFFE.

MUCH has been written, and much money wasted over this unhappy water question. But to-day the mines are as far off a solution of the difficulty as they were two years ago. Indeed, the position grows worse each day, as new company after new company obtains more or less money from the public. The amount sunk in Western Australia was a few years ago comparatively small; to-day millions have been subscribed, when two years ago thousands were considered sufficient. It is not necessary here to point out the danger of floating companies with small working capital, in a country where labour is expensive, fresh food hard to obtain, and water the most rare of all commodities. Neither is it my intention to criticise the somewhat reckless manner in which flotations have been made during the past year. The gold mines of Western Australia are so rich that neither dear labour, nor expensive food, nor high rates of carriage can stop the progress of the country once the water question is settled. The Sydney *Bulletin* may sneer at the wild cats of West Australia, but I am not aware that more wild cats have been floated in London during the past two years than were floated in Victoria during their own mining boom. Indeed, so rich in reefs is West Australia that there is absolutely no demand for "wild cats." Anyone may go out into the bush and peg for himself. No man prospecting in the colony need fear of finding reefs. As to whether these reefs will pay to-day is another question. But they are not wild cats. There are hundreds of mines in Western Australia in which the reefs carry from 10 to 20 dwts. These mines are not wild cats. They are simply mines which will never pay until some good water scheme has been established. Bayley's Reward has many thousands of tons of 1 ounce stone which to-day will not pay for crushing, but which would pay splendidly if Coolgardie had as much water as they have at Charters Towers, where in the early days there was no water at all. At the 90-Mile there are literally millions of tons of quartz waiting for ample water supply, the Caledonian mill being only run upon the richer stone in the mines. At the Black Flag Proprietary there is stone enough to keep a 100 head battery going for years. But here, again, they will not be able to run more than 20 or 30 with their present supply. At Hannan's the water difficulty is acute. I have mentioned the 90-Mile, Black Flag, because in these places the water is more plentiful than upon any other camp in the field, except, perhaps, Ménzies. But Hannan's is the field *par excellence*. Here the reefs are both wide and rich; here no one seems to make a mistake; the whole 10 miles of reefs are marvellously rich. *Cui bono?* No one can crush. The Great Boulder ekes out a splendid existence by mining the wet ore from the 200 foot level, with the drier lode taken from above the 50 feet. It runs its 10 head steadily enough, and it also runs 10 head in the Lake View when it can. It has just about enough water to keep a 20 head going. The Great Boulder is the only mine with a constant water supply drawn from the so-called lake, which is only a salt pan with a granite bed in which the water is held.

The Brownhill has taken its fate in both hands, and its dry crushing plant may succeed, but it will be a bold man who prophesies success here. Lake View, with its schistose quartz mixed with kaolin limestone, will take 30,000 gallons a day to keep its 20 head going, and they have no earthly chance of getting half this amount. Ivanhoe and Iron King have just enough water to crush six months out of the twelve. Few of the other Hannan's properties can count upon more than a few thousand gallons of water a day.

Now I ask:—Can this state of affairs continue? Is it reasonable? Here we have a magnificent series of mines, "rich beyond the dreams of avarice," and nearly all lying idle for want of water. I say that it is not a question for private enterprise, but a national question.

The future prosperity of Western Australia is bound up with that of its mines. Private enterprise in a colony ruled as Western Australia is, by a Government which does everything, is cramped. It has not the free scope it requires. The Government will not grant monopolies, and perhaps wisely. It says, "Find water; supply it; but we make no promises." This does not suit the capitalist. If he puts down his millions he wants a monopoly. Water cannot be obtained in Western Australia unless some one—either the Government or a big corporation—does put down from 5 to 10 millions. The capitalist cannot run the risk. The Government must, therefore, do the thing themselves. They have no choice. They cannot any longer stand on one, side, and see hundreds of thousands of English capital lying fallow. They cannot any longer make excuse that the gold industry is not firmly established. Water in unlimited quantity can be procured if enough money is spent. That money must be spent and without delay, or the consequences will be serious. I do not desire to enter into any discussion upon the various schemes now before the public for getting water. Some are good, some doubtful, some ridiculous. But none can ever start because no monopoly will be given, and none could ever pay if unlimited competition had to be faced. I take it that we may rule the private company out of the field. The reason I write this is to urge upon the London shareholders to combine to force this water question upon the Government. They will not find Sir John Forrest unreasonable. He is a shrewd, hard-headed man of business, but he is also a politician who knows that he can make no more unless he has the initial force behind him. Give him the start he wants, the pressure of public opinion, and he will soon bestir himself. At present he has been content to establish an efficient water supply for man and beast along the colonial roads. He must now take a further step and supply the mines themselves, or let someone else do it. It can be done; any amount of money would be subscribed in a few hours to find the required capital. It would pay either the State or a corporation. I am afraid the latter is out of all question without a monopoly. That will never be granted in democratic Western Australia.

The newly-established Mineowners' Association, which began operations in Perth a few weeks ago, might make the water question their battle ground, but they must get support in London. London shareholders should clearly understand that unless water is soon pumped up into the gold fields, the result will be a collapse of all mining operations. Water, water alone, means dividends. Surely this temptation is strong enough to rouse even the most lethargic shareholders.

The directors of the BRADBURY'S WORLD PATENT DRILL SHARPENER COMPANY (LIMITED) have decided to declare a dividend of 10 per cent., payable on or about August 12.

The list of applications for shares in NATALE COLLIERIES AND DURBAN COALING STATION (LIMITED) closed on Wednesday at four p.m. for London, and on Thursday for the country.

THE PRESENT POSITION OF GOLD MINING IN WEST AUSTRALIA.

By CARL SCHMEISSER.

(Translated especially for *The Mining Journal* from the "Zeitschrift für Praktische Geologie," May, 1896.)

(Concluded from page 784.)

Mining.

Placer Mining.

THE gold diggers who rushed to Western Australia upon the first reports of the rich finds there, naturally commenced operations first upon the alluvial deposits, which they worked by means of dry blowing on account of the want of water, which was even more sensible then than it is to-day. These placers, so far as such have already been discovered on the gold fields, were worked with such activity that they may be looked upon as practically exhausted by this time, as far as coarse gold is concerned.

It is, however, not improbable that a great deal of gravel still contains a sufficient quantity of fine gold; this may make it fairly profitable to work the alluvial ground up with other ores in stamp mills or cyanide works.

Bed and Vein Mining (Reef Mining).

Ore Getting.

The situation of the various placers in close proximity to the reef outcrops readily led to the prospecting and opening up of the primary gold deposits. As appears from the list of vein groups, these operations rapidly extended over a large area of land; nevertheless, mining operations have in very few mines attained to the actual exploitation of the deposits. In the majority of mines it is confined to preparatory work; in a great many to simple prospecting.

Separation of the Gold.

The ore got in prospecting operations and in exploitation on a very small scale, is often treated by pounding in a mortar, picking out and panning out the coarse gold, and at times by crude amalgamation of the fine gold.

More important mines crush their ore in stamp mills of 5 to 30 heads, in Otis, Huntington, or Panlast mills, get the gold, or as much of it as is free, by amalgamation, and collect the tailings for subsequent after-treatment by a leaching process. Hitherto the experiment has only been tried at Golden Bar, for the sake of saving water, of getting as high a percentage as possible of the gold present by a single process consisting of dry crushing and cyanidation. According to an apparently trustworthy communication, the gold thus left in the tailings amounts to only 2 dwt. to the ton.

According to the annual report of the under secretary for mines in Perth, there were in the year 1894:

On the Murchison gold field, 15 stamp mills, 4 Otis mills, 2 Huntington mills.

On the Pilbara gold field, 7 stamp mills.

On the Kimberley gold field, 4 stamp mills.

On the East Coolgardie gold field, 5 stamp mills, 2 Otis mills, 1 Krom roll plant.

On the Coolgardie gold field, 8 stamp mills, 3 Panlast mills, 1 Krupp's ball mill.

On the Yilgarn gold field, 5 stamp mills.

Numerous additions have been made to this list of mills in the year 1895, whilst machinery for several new plants is being delivered or is on the way, amongst which may be mentioned a mill of 80 head of stamps to be erected at Northam for Southern Cross mines; I was not, however, able to obtain satisfactory statistics respecting the total number of stamps now in existence.

Moreover, the view has been recently gaining ground more and more, that the trial of other processes than stamp milling is locally indicated so as to economise water, such as dry crushing with cyanidation and amalgamation according to the Mac Arthur-Forrest, or the Siemens' and Halske, or the Salmon-Teed method, or, perhaps, other suitable processes that admit of the maximum possible extraction of gold. It might be advisable to test the method of dry separation by Pape-Henneberg's process together with dry crushing. At Hannan's Brownhill Gold Mine a plant is being erected in which the ores are to be treated by dry crushing, combined with cyanidation and simultaneous amalgamation.

Whilst there is, particularly in the northern and western gold fields, generally a sufficient quantity of water for milling purposes to be obtained at depths of only 70 or 80 feet, milling in the southern districts, as far north as the East Murchison gold fields, meets with the greatest difficulties on account of the universal scarcity of water in that country.

According to experiments made in the Kalgoorlie district, the consumption of water can be brought down as low as 240 gallons a day per ton of ore milled; however, by exercising the most rigid economy and by most carefully using the water over and over again. Ultima's, however, the water returns so muddy that it partially prevents the amalgamation of the fine gold. If with clean water only 55 to 60 per cent. of the gold can be got by amalgamation, the production will be much less still when muddy water has to be used. In either case, however, the tailings have to be submitted to further processes for the extraction of the gold, which processes entail an additional consumption of water.

As I have already pointed out, the statement which has repeatedly been published in the European Press, that the lakes of West Australia contain water, which, although salt, is in inexhaustible quantities, is utterly opposed to fact. The waters that collect in these lakes after heavy rainstorms rapidly disappear in the sand, and have to be pumped up again. Moreover, the average rainfall of the year is very small on nearly all the gold fields; during 1895 the rainfall at Coolgardie was only 6.54 inches.

The various mining companies attempt to collect atmospheric precipitations over extensive areas by means of tanks, and to recover the water that has soaked into the sands of the lakes by means of wells, as also to get water supplies by means of deep shafts and deep boreholes in the mines or in the adjoining areas.

Although in individual cases it has been possible thus to get sufficient water for a small number of stamps by using it with the most rigid economy, and although a borehole on Block 59 of Hampton Plains has opened up a water supply, which is capable, according to pumping trials, of supplying 1600 gallons per day, I, nevertheless, fear that all these exertions and attempts to obtain sufficient water for the domestic purposes of all the inhabitants and for milling operations with 2000 to 3000 heads of stamps, will, in spite of everything, lead to no satisfactory results.

The Colonial Government, sharing these views, has, as the Premier, Sir John Forrest, explained at Kalgoorlie, on his visit to the gold fields, been taking into consideration the advisability

of bringing in a water supply from a distant but inexhaustible source—the Helen, or the Murray River.

Seeing, however, how large is the area of the gold fields, and how scattered the mines are in them, it is quite natural that only the main groups of veins could participate in this advantage. The solitary and the distant mines will have to rely, then as now, upon their own water supplies. For these it will be indispensable to employ only such processes as can work with the minimum possible consumption of water.

I see no serious difficulty for mining in the probable increase of pyrites in depth. Of course, the various companies will then have to make up their minds to put up plants for the concentration of the sulphurites, as also to the erection of some central chlorination works, unless the amount of pyrites should prove to be so small that it can be worked up without previous concentration in the cyanide plants.

Fuel.

Coal does not exist on the gold fields; it has, however, been found on the Irwin and the Collie Rivers; but too little work has yet been done to enable an opinion to be formed as to the significance of these discoveries for gold mining. In the southern mining districts, wood, both for fuel and for construction purposes, is generally to be obtained in sufficient quantity, whilst in the central area it can only be procured at very great expense.

Generation of Power.

Whenever the absence of a sufficient supply of good water for boiler purposes is combined with the want of suitable fuel, the employment of oil engines, instead of steam engines, as generators of power, will have to be more seriously considered than has hitherto been the case. The erection of a central generating station on the sea coast, and the production of electrical power by means of East Australian coal, would be most valuable on account of the ready way in which such power could be distributed to the consumers, if the technical execution and profitableness of so vast an undertaking could be guaranteed by electricians with sufficient certainty in the present condition of electrical science.

Labour.

Only white miners are employed, working eight hour shifts, whilst wages are 10s. to 15s. a-day. The number of men at work cannot be given with sufficient accuracy, because statistics are difficult to obtain with men continually moving from place to place over so vast an area. The general mass of the men is composed of well-trained East Australian reef miners; but as large numbers of the workmen previously followed other very different callings, and were only tempted to the gold fields by the hope of high wages, many complaints are heard of the deficiency in technical mining skill.

Coloured workmen are not allowed in the mines at all by the white working men, and only tolerated with great unwillingness as cooks, gardeners, and servants.

Hygienic Conditions.

Although typhoid and other fevers are, unfortunately, very prevalent in the towns of the gold fields, and somewhat less so in the smaller mining camps during the summer time, it may, nevertheless, be said that the general health is no worse than it has been at the outset in other gold fields with such surprisingly rapid development. It may fairly be assumed, considering the generally speaking good climate, in spite of the great heat of the summer, that, when the necessary sanitary precautions have been enforced, particularly as regards the disinfection of waste products, and when the water difficulty has been satisfactorily settled, a decided improvement in general health will be produced.

Public Safety and Justice.

The safety of person and property are in a thoroughly satisfactory condition. The code of mining laws does not yet give entire satisfaction; it may, however, be expected that such prejudices as may be caused by the administration of the law will meet with due consideration and emendation. Mining regulations do not yet exist, but will have to be introduced as mining operations are extended.

The Colonial Government has certainly demonstrated the best intention of turning the condition of things to satisfactory account. Quite recently a great deal of fault has loudly been found by some, but they should remember that the transition from a colony devoted to agricultural and pastoral pursuits to an industrial state in a high degree of development, and with the most advanced arrangements, could not be expected to take place more rapidly, seeing how short a period has elapsed since the discovery of the gold fields.

Gold Production.

According to the Customs Returns, the export of gold from the colony is given in the subjoined chronological table:

Year.	Weight.	Value.	Discov. red in this year.	Proclaimed in that year.
1882	—	—	Kimberley Gold Field.	—
1886	302 0 0	1,147 12 0	—	Kimberley Gold Field.
1887	4,873 0 0	18,517 8 0	Yilgarn Gold Field.	—
1888	3,493 0 0	13,273 8 0	Pilbara Gold Field. West Pilbara.	Yilgarn Gold Field.
1889	15,492 10 0	51,871 10 0	—	Pilbara Gold Field.
1890	22,806 6 0	86,663 19 9	Yalgo, Ashburton Gold Fields.	Ashburton Gold Field.
1891	30,311 1 9	115,183 1 2	—	Murchison Gold Field.
1892	59,548 6 4	226,283 11 5	Coolgardie, Dundas Gold Fields.	—
1893	110,890 18 5	421,285 9 2	East Coolgardie Gold Field.	Dundas Gold Field.
1894	207,181 6	878,098 19 10	North Coolgardie, East Murchison Gold Fields.	Coolgardie Gold Field.
1895	231,512 13 21	879,748 4 11	—	East Coolgardie, North Coolgardie, East Murchison, Yalgo, West Pilbara Gold Fields.

The separate gold fields contributed in the following proportions to the above amount exported during the year 1895:

	Ozs.	dwt.	grs.
Coolgardie	126,105 18 18
Murchison	65,477 5 3
Yilgarn	19,747 15 2
Pilbara	19,522 8 0
Kimberley*	876 13 16
Ashburton	540 15 4
Dundas	241 18 2

These amounts do not, however, represent the total production, because quantities of gold are continually being taken away by miners without notifying the authorities. In order to obtain more accurate statistics, the Colonial Government intends to have figures representing the output, collected by the recently-appointed Inspectors of Mines, in addition to statistics of export, and to make neglect on the part of mine managers to declare their production a punishable offence.

The yield of gold is very irregularly distributed, both according to the gold contents of the ore, and to the very varying technical ability with which the mines are administered; its amount ranges in different mines from 6 dwt. to 16 ounces of gold to the ton. The tailings produced in treating the ore still await further treatment for the extraction of fine gold, until cyanide works shall have been erected. Only one such plant is in operation at Golden Bar, whilst a second one at the Murchison Consolidated Gold Mine is very shortly to be set to work.

The gold as won is fairly pure, and is only alloyed with a moderate proportion of silver and other metals, so that the ounce of amalgam gold fetches a price of about 76s., whilst the ounce of washed placer gold fetches about 72s.

Working Expenses.

It is a very difficult matter to assign the amount of working costs at the present moment, because but few mines are engaged in exploitation, and these have not yet settled down into uniform conditions of work; besides which the bases of different companies are quite extraordinarily divergent.

Several of the most advanced, and, therefore, especially cheap-working mines of the Murchison district gave their cost as 30s. to 33s., of course, without including interest or amortisation of their working capital. In the Coolgardie gold fields the costs probably not very different upon the whole to what it is in the Murchison district, because the higher price of water would be about counterbalanced by the lower cost of supplies.

These costs probably range from 30s. to 50s. and more to the ton of ore; they will increase with greater distance from the nearest railway station to such a point as make the less rich or more difficult workable deposits quite unpayable.

Better technical arrangements of mining generally, in part by entrusting the management to men who know more about their business, in part by the amalgamation of smaller mines into larger companies, the cheapening of the water supply when the various schemes for obtaining water have been put into execution, the introduction of more moderate freights for the main necessities of the mining industry, as also the general cheapening of the necessities of life, after the railways now projected have been constructed, all these improvements will have a favourable effect in reducing working costs to more reasonable figures.

Profitableness.

When this has been done, the profitable working of many mines will be rendered possible, the ore of which is to-day not rich enough to pay, or which, if the present working costs were to continue, would in time be unable to pay their way, since, according to my geological prognostications, in many mines when a certain depth is reached, the high yield of gold can no longer be expected, which is now to be got whilst the outcrop ore is being worked.

As regards the probability of the mines paying, there are also other important considerations to be kept in view, which I must not omit to mention here.

The Australian prospector is thoroughly alive to the fact that the extraordinarily rich pockets, which are so often found at the outcrops of reefs, disappear very rapidly as soon as any depth is attained; he, therefore, does his best to sell his discoveries as rapidly as he possibly can. The requisite expert's report is naturally a brilliant one, as long as the so-called expert does not insist on deeper shafts being sunk and levels driven to enable the deposit to be thoroughly investigated. Experts of very doubtful capacity and trustworthiness are without any doubt to be found on these gold fields. Men of all manner of callings—ex-sailors, officers, physicians, druggists, merchants, book-keepers—become mining experts with surprising rapidity as soon as they breathe the air of the gold fields and get a glimpse of the shining yellow metal in its natural deposits. The most curious occurrences are chronicled; thus one of these experts reported on a deposit solely on the strength of a selected specimen that was submitted to him. It would not be difficult to quote several similar cases indicative of the standard of technical knowledge and integrity of a good many of the mining engineers.

As the entire deposits were so often judged by the rich outcrops, the most exaggerated views became current as to the value of many mines. The extraordinary demand of European mining companies, which insisted upon obtaining at any price Australian gold properties for the formation of companies, contributed to the remarkable rise in the price of these properties.

The Australian middlemen generally added a most disproportionate commission to the original purchase price, and the European company-mongers thought they could not make the original capitals of such supposed excessively valuable deposits high enough; they hurriedly divided off subsidiary properties from the larger mining properties, without any substantial prospecting operations, in order to utilise them in the formation of so-called sub-companies, again, too, with the highest possible working capitals. Thus mines have been floated with very considerable working capitals, which can only possibly pay any dividend by being worked on a small scale and with the most rigid economy.

This exorbitantly high capitalisation naturally excludes the possibility of the mines paying in the majority of cases. But when the dividends, so anxiously awaited by the shareholders, are not forthcoming, the collapse, sooner or later, of the over-capitalised mines is unavoidable. Such undertakings as are founded on sound properties will be able to weather the crisis, albeit with considerable reduction of capital; the poor mines, however, must go under, many thereof for ever. Moreover, the game that has been played on all gold fields has been repeated in Western Australia; in the interests of Stock Exchange speculation, the ores of certain mines get poor for a time according to report, strikes break out, the mines are 'drowned out', or else the opposite course is pursued, false reports of especially rich pay chutes on reefs are spread about, or else to keep up quotations, only the richest parts of the deposit are worked at all. Stock Exchange gambles only too often interfere lamentably with the proper technical development of mining.

The European capitalist who wants to invest in West Australian mines should not, in blind confidence, take shares in undertakings that are prised up by some unknown worthy,

* In this are included 112 ounces, which are given under the statistics under Wyndham.

but should investigate matters with the utmost care, and avail himself of the services either of larger companies or firms of acknowledged unobjectionable business standing, or of mining experts of spotless career.

Mining companies should select only men of the utmost confidence and experience for their managers, and take care to pay them such salaries that the desire, only too easily aroused on a gold field, of making their fortunes by private speculation, may as far as possible be held in check. Such managers can also be entrusted with fuller powers of initiative and action, because if it is attempted to control technical matters too closely from a distant place, such as London, Paris, Berlin, or Melbourne, expensive blunders are inevitable. It is also highly necessary to send at frequent intervals thoroughly experienced confidential agents to examine the manner in which the manager conducts his business, unless resident representatives on the gold fields undertake this duty.

Conclusions.

Nature has placed serious difficulties in the way of West Australian mining. On the other hand, many of the deposits are of great richness near the surface; this richness will not, however, as has already been pointed out, continue as the mines increase in depth. Many mines, whose rich ores have astonished the world, will have to content themselves with a yield of 12 to 20 dwt., and will only be able to maintain their outputs by a notable increase in the quantity of ore mined, and by enlarging their reduction plant. Under these circumstances, it is absolutely necessary to work in the most miner-like manner, and by taking advantage of all the experience of modern science.

We are, however, entitled to expect that the energetic and experienced men who are exploiting the underground treasures of Western Australia, supported by an enlightened Government, will succeed in conquering present or yet future difficulties. Even after the many unworkable deposits have been weeded out, there will still remain here a considerable number of rich or sufficiently payable deposits, to which many others will presumably be added, seeing how extensive the area of the gold fields really is. These will assure to Western Australia for a considerable time to come, a good position amongst the gold-producing countries of the world, even though not the pre-eminent position to which many sanguine spirits would like to elevate it.

In drawing up this report, I have purposely abstained, as far as possible, from entering into details of the conditions of individual mines, because I wished to avoid either to give an opinion in favour of certain mines, or to injure others by the institution of unfavourable comparisons.

In my travels through the West Australian gold fields, and in collecting the materials for my work, I have always received the readiest assistance from all the officials of the Colonial Government, as also from the various mine managers, especially from the partner of the London firm of Bewick, Moreing, and Co., who is in charge of their West Australian business, who accompanied me in my journey. I am anxious to express my sincere thanks to all these gentlemen.

I have presented a report of similar tenor to the present one to His Excellency the Prussian Minister for Trade and Commerce at Berlin.

ROYAL AGRICULTURAL SHOW AT LEICESTER.

AT this show Messrs. Robey and Co. (Limited), Globe Works, Lincoln, Stand No. 374, exhibit the following:—One improved portable steam engine, fitted with high speed equilibrium governor, expansion eccentric, steam jacketed cylinder, boiler made of the best mild steel plates by the Siemens-Martin process, and suitable for a working pressure of 90 lbs. per square inch. These engines are noted for their great strength, extreme simplicity of design, great economy of fuel, and ease of management. One wrought angle iron frame thrashing and finishing machine, fitted with adjustable corn screen, and guaranteed to finish the corn for market in a first-class manner. One Robey undertype compound engine and locomotive boiler combined, fitted with patent automatic governor and link expansion gear, the boiler made of the best mild steel plates by the Siemens-Martin process. This engine has the following advantages:—It is very powerful for the space occupied. It works with perfect regularity with very varying loads. It is extremely economical in fuel, consuming under 2 lbs. of best Welsh coal per indicated horse power per hour. The working parts are perfectly balanced so as to run safely at high speed. They have large wearing surfaces of ample size, and run cool with heavy loads. The engine is well lubricated for long runs. One long stroke horizontal fixed engine, fitted with patent automatic trip expansion gear, which is extremely simple, economical, and effective. One open front high-speed vertical engine, fitted with automatic shaft governor acting on the slide valve direct. The crosshead of this engine is of special construction, with a steel gudgeon having a conical head, the piston rod being secured to the crosshead by a coned nut and cotter. With this construction the removal of the piston is much simplified. All the working parts have ample surface, and are fitted with proper lubricating arrangements. The reciprocating parts are carefully balanced, and the engine throughout is manufactured of the best materials, and with workmanship of the highest class. One medium stroke horizontal fixed engine, fitted with patent automatic governor and link expansion gear, which works at a practically constant speed under varying loads. One improved gas engine possessing the following important advantages:—Patent sensitive governor; patent positive lubricator; patent igniter; patent patent multiple impulse self-starter; patent pressure starter; improved combustion chamber; improved exhaust silencer; special balanced cranks.

THE MINING "BOOM" IN COLORADO.—The extent of the mining boom in Colorado is illustrated by a "Mining Stock Manual," issued by a firm of brokers in Denver, which gives a list of about 600 new mining companies incorporated to transact business in Colorado during 1895 up to December 17. The aggregate capital of these companies is about \$300,000,000. On January 2, 1895, there were 17 Cripple Creek mining stocks listed on Colorado exchanges, the aggregate capital being \$25,150,000. The average market value of the shares on January 2 was 753 per cent. of par, or about \$1,900,000, and on December 1, 31·28 per cent., or \$7,900,000, showing a profit to holders, based on the increase in market value, of 315 per cent. on their investment, or about \$6,000,000. What dividends were declared is not stated. It is safe to predict that the 600 new companies incorporated in 1895 will not give a profit to their stockholders of 315 per cent. in 1896.—*The Engineering Review and Metal Market.*

THE LAUTARO NITRATE COMPANY (LIMITED).—Notifies that the dividend of 5 per cent., payable June 28, on the coupons serial No. 6 of the share warrants to bearer, and the coupons of the Five per Cent. Debentures due July 1, will be paid at the City Bank, 5, Threadneedle Street, E.C.

MEETINGS OF MINING COMPANIES.

RAND-RHODESIA EXPLORING COMPANY, LIMITED.

THE first ordinary general meeting of the shareholders in the Rand-Rhodesia Exploring Company (Limited) was held at Cannon-street Hotel, on Tuesday, Mr. C. C. Cannell presiding. The SECRETARY (Mr. Lancelot C. Walton) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—Owing to the absence of our esteemed Chairman, Mr. W. A. Wills, who is at present in Bulawayo, I have been requested by my colleagues to preside at this meeting. The balance-sheet and profit and loss account have been in your hands for some days, and are, I think, very simple and straightforward, and will require very little comment from me. You will see that the raised profit, after writing off all preliminary expenses, amounts to £14,037 19s., which, taking into consideration the unfortunate collapse which took place in the market towards the end of last year, cannot, I think, be looked upon as unsatisfactory. Out of this balance of £14,037 two dividends of 10 per cent. were declared, leaving balance of £5135 15s. 9d., out of which the directors would have been perfectly justified in recommending a payment of a further 5 per cent. dividend, but, under the existing circumstances, we considered it would be more prudent, and that your interests would be better served by not doing so. The balance of 1750 shares, which were unissued at the date of the report, have since been issued, and the £250 due on 500 ordinary shares has since been paid, so that the whole of the £50,000 ordinary shares are now issued and fully paid. Referring to the profit and loss account, I think you will agree with me that the item of rent of office, salaries, &c., £700, is very fair, as also is the item of general charges, advertising, &c., £476. The directors' fees appear to be rather high, amounting to £885 4s. 3d., but I would explain that the directors are paid by results, receiving 10 per cent. on the amount which is declared and available for dividend. No doubt you would like me to give you some few particulars as to the investments of the company which appear in the balance-sheet at cost price, but which, as stated in the report, were, according to market prices, of greater value at the closing of the book. Three of your directors are at present, or rather have been, in Bulawayo—namely, the Hon. John Scott Montague, M.P., and Messrs. Wills and Lomas, the former of whom is now on his way home again. These gentlemen have used, and will use, their best endeavours to further your interests in Rhodesia, and I hope soon to be in a position to give you some favourable news as to the result of their efforts; but it is only fair to anticipate that their presence there, under existing circumstances, will enable them to obtain some valuable interests on behalf of the company. The company's principal holdings of shares are in the companies to which I will now refer. First, there is the African Trust (Limited). The position of this company at the present moment is very sound. It has a large interest in the Bulawayo Estate and Trust Company (Limited), together with a valuable option over 56,000 shares at par for 18 months from the time of registration of that company, and has also some very promising holdings in other estates and companies on the Rand and in Matabeleland, which can hardly fail to be extremely remunerative as soon as matters in South Africa assume normal conditions. The next one is the Bulawayo Estate and Trust Company (Limited), which was formed by the African Estates and African Trust Companies jointly, and has a nominal capital of £250,000, of which £89,000 is issued. Its assets consist of about 650 claims, partly developed, situated in some of the best districts in Matabeleland, and options to purchase a further 710 claims, a grant of 250 square miles in Mashonaland, the greater part of which has already been located, as well as other valuable assets. The £60,000 working capital in hand is practically intact. The managing directors of this company, Messrs. B. M. Woolian and W. A. Wills, are to be remunerated according to results. Then there is the Elephant's Kloof Gold Mining Company (Limited). This company has a capital of £200,000, of which £30,000 was privately subscribed for working capital, and 45,000 shares are held in reserve. The purchase price of this property was 125,000 fully paid shares only. It possesses 130 claims, situated on the De Kaap gold fields, about five miles from Barberton. Actual crushings of 5833 tons of ore previous to the acquisition of the property yielded 5302 ounces of gold over the plates, and the tailings are estimated to be worth about 30 dwt. A well-known and experienced American mining engineer has been appointed general manager—I refer to Mr. Roberts—and from latest reports he is energetically pushing forward the development of the property. Several rich strikes have been made, assays from which run up to several ounces to the ton, while the reefs are a fair average width, and easily worked. No difficulty is anticipated in the treatment of the ore. The manager in his first report was exceptionally cautious in his statements, but he now states:—"I feel quite safe in prophesying a good future for this company." (Hear, hear.) I next have to refer to the Western Witwatersrand Exploration Company (Limited). This property consists of 356 claims and 1200 acres of freehold property. The directors have good reason to suppose that the Randfontein series of reefs run through a large portion of their claims. A diamond drill is at work on the property, and has reached a depth of over 300 feet, having already passed through the soft clay, and has touched solid sandstone. The directors hope to strike the reef at a depth of not more than 1000 feet. Many applications have been made for stands on this company's property, owing to the Transvaal Government having just purchased some adjoining ground for the purpose of making a township and erecting Government offices, which action has, of course, considerably enhanced the value of its property. The railway will pass close to this ground, and the station will only be about 200 yards from the southern boundary of this property. There is a never-failing supply of water running through the property. Another company in which we are interested is the Premier Tati Monarch Reef Company. This company possesses a large property on the Tati fields, and has a large quantity of low-grade ore developed. Milling started with 15 out of the 30 stamps erected last March, but on account of the Matabele outbreak all work was, unfortunately, totally suspended for some time. It is hoped that the fall battery of 30 stamps will commence working as soon as the troubles are over, and a prosperous future is anticipated for this company. These are the principal properties in which we have interests of any magnitude. Of course, we have several smaller interests, but it is hardly worth while going into detail with reference to those. I now beg to move the adoption of the report, balance-sheet, and profit and loss account for the period ending March 31, 1896. (Applause.) The resolution will be seconded by Mr. Bourke, who, as a director of the Africa Trust and Western Witwatersrand Exploration Company, will no doubt be able to give you some further particulars with reference to those companies.

Mr. H. E. M. BOURKE, in seconding the resolution, stated that, in his opinion, the balance-sheet presented was very satisfactory. He had much pleasure in saying that in the Africa Trust they had a very good outlook. The fact that the Chairman of this company, as well as one of the managing directors of the Bulawayo Estate and Trust Company (Limited), had been in Bulawayo for some time, and that during his stay there he had been able to look into such properties as might be offered to him, would place him in a position to give the shareholders some valuable information upon his return. The Western Witwatersrand Exploration Company, according to reports which had lately come to hand, was also giving promise of favourable results to its shareholders, and he felt confident of the prospect of both those undertakings. So far as the Rand-Rhodesia Exploring Company was concerned, he thought the shareholders would see that the directors were justified in pursuing the course they had taken—namely, having a large reserve of capital in hand uninvested, so as to be able

to take advantage of anything that might turn up after the very unsettled state of affairs in the country with which they had to deal. If matters in South Africa shortly took a better turn—and many of them believed they would—this company would be in a position to do business, and probably again pay a handsome dividend. In conclusion, Mr. Bourke assured the shareholders that the directors were very constant in their attention to the business of the company, and were most anxious for the co-operation of the shareholders.

Replying to questions asked by SHAREHOLDERS, the CHAIRMAN said no portion of the £100,000 preference capital had been issued, but the directors had power to issue it when they thought fit. At the present time, however, there was no intention on the part of the directors of doing this. The Chartered Company had no interest whatever in the Rand-Rhodesia Exploring Company. With reference to the directors, Messrs. Tapp and Partridge had retired, and Sir Henry Barnaby and Mr. Banks had been elected to the vacancies thus caused.

The resolution was carried unanimously.

The retiring directors, Sir Henry Barnaby and Mr. Bourke, were re-appointed, and also the auditors, Messrs. Fox, Sissons, and Co.

A vote of thanks to the Chairman and directors terminated the proceedings.

NEW VANCOUVER COAL MINING AND LAND COMPANY, LIMITED.

The annual general meeting of the shareholders in the New Vancouver Coal Mining and Land Company (Limited) was held on Tuesday, at the offices of the company, 12, Old Jewry Chambers, E.C., under the presidency of Mr. J. GALSWORTHY.

The SECRETARY (Mr. Joseph Ransden) read the notice convening the meeting.

The CHAIRMAN, in moving the adoption of the report and accounts, said the output during the year 1895 showed a decrease as compared with 1894. In the latter year the output was 345,000 tons, but last year it was only 289,000 tons. The prices obtained were also less, the cost of raising, owing to the decreased output and the faulty and hard ground they had had to go through, had increased. Consequently, instead of making a profit as in 1894 of £11,000, the result of last year's work had been a loss of £3600. This was not the first time the company had encountered vicissitudes, but they had survived them in former times, and, no doubt, would be similarly successful in the future. That, however, the property still remained a valuable one there could be no question. That it was a difficult one to work there could be no question. The directors had been urged by several shareholders to seek the assistance of experts, but all he would say in answer to this was that the most able and scientific man they could produce would not be able to tell them more about their mine than those who at present worked it. The manager, Mr. McGregor, had been with them a very long time, and he did not suppose any one could know more about the field than he did. Then Mr. Robins, the superintendent, had very carefully studied the matter, and was as competent to judge as any expert they could send out. Under these circumstances, to send out experts would simply be throwing away money. They must rely on the exertions of their employees only to bring them again into a position where they would be able to pay dividends. Notwithstanding the bad times, the directors still continued to set aside the requisite amount for depreciation, maintenance, and repairs—items which in this concern amounted to very considerable sums. Still they did not think because no profits were shown that they should discontinue to make the requisite allowance for these items, and, therefore, in the present accounts they appeared to their full extent. The 10 per cent. reduction in the wages of the miners and salaries of the other officials had now been in operation for nearly three years. He believed that reference to the balance-sheet would show that the financial position of the company was substantially good. The £13,000 odd balance brought forward from last year in the profit and loss account has been reduced through the loss on the 12 months' working to just over £6000. The large item of £310,000 for estates, buildings, collieries, &c., still remained much about the same. In future the amount expended on the surface would cease, as the directors had impressed upon Mr. Robins the necessity of discontinuing such a policy. The reserve fund now stood at £40,000. Altogether the liquid assets of the company were sufficient to meet the debenture debt, which now stood at only £67,100. He, personally, still put his confidence into the substantiality and goodness of the property, and he felt sure that they would have a return of good fortune before very long. He hoped certainly to be able to report at the end of the present half-year that no loss had been incurred, and that at the end of the following six months that they were making a profit again.

Mr. JOSEPH FRY seconded the resolution.

General GILLESPIE characterised the accounts as very unsatisfactory, inasmuch as that the information given was very meagre. They might have very good men at the mine, but what was required was some one who could secure them more business. Their shares were absolutely unsaleable, and he considered that some fresh blood should be infused into the management of their affairs.

Mr. TENDRON (a director) said the board also were not pleased with the present state of affairs, but no good would be done if they expressed their views in the same way as General Gillespie had done. With regard to the sale of the coal, the competition was very keen in San Francisco, and although their agents were very influential men it could not be expected that they would be able to induce people to buy their produce when they could get the same at a lower rate than the company were able to sell it.

General GILLESPIE expressed himself as quite satisfied with the explanation given by Mr. Tendron.

After some further discussion, the resolution was carried *en cons.* The retiring director, Mr. Elwin Andrew, and the auditor, Mr. Samuel Lovelock, were re-elected, and the meeting concluded with a vote of thanks to the Chairman and directors.

CITY AND COLONIAL SYNDICATE, LIMITED.

The first ordinary general meeting of this company was held on Saturday, at the Cannon-street Hotel, Mr. J. E. PERRY in the chair.

The SECRETARY (Mr. E. J. Andrews) having read the notice convening the meeting,

The CHAIRMAN said: Gentlemen—This, as you know, is a statutory meeting, and there are no accounts or formal report to present to you. But you will, no doubt, like to have a few words from me to explain the present position of the syndicate and the business which we have undertaken on your behalf since we went to allotment three months ago. The shares were well applied for, but we do not propose under the circumstances, which I shall presently explain to you, to allot any further shares in the syndicate on the original terms. We shall still have some shares unallotted, but these we propose to retain in our treasury for future issue, on such terms as may seem advisable in the interests of the syndicate generally. Partly as a consequence of the small sum of cash at our immediate command, and our desire not to call up at once the full amount of the shares, but more especially because the directors have not been anxious to have on their hands any new properties just now, we have refrained for the present from equipping the expedition referred to in the prospectus. This branch of the undertaking, however, will have our careful attention directly we have satisfactorily disposed of the business now in hand. This business is, primarily, the Nowthanna Gold Mine, our option on which was, after careful examination by the directors, duly exercised. You have all had full particulars of this property, and I am glad to be able to inform you that the necessary arrangements for the issue of this mine in the immediate future are so far advanced that I think I may treat them as practically complete. The property comprises 24 acres in the Murchison district of Western Australia. The reports and prospects are excellent, the conditions of purchase very reasonable, the capitalisation moderate, and the amount provided for working

capital should be ample. Reports show the mine has been so far opened up that there is sufficient rich ore at grass and in sight to keep a crushing plant going for 18 months. I may say, whilst it is not expedient for me to give detailed figures, that we shall do very well out of the issue of the Nowthanna Mine, and that if, as we have every reason to believe, that mine fulfills our anticipation of its merits, we shall soon be able to congratulate the shareholders of the syndicate on a very handsome return on their capital. We are also interested in the Noggetty Gully Gold Mine, situated in the Calliope gold fields, Queensland, which will also be issued very shortly. Here again the price is moderate, the capitalisation will be reasonable, and an ample amount reserved for working capital. The property is 16 acres in extent, and is a going concern, with 15 heads of stamp, winding, and pumping machinery complete. Reports on this property state that 5 dwts. per ton should amply cover the working expenses, and actual crushings have yielded from 2 to 4 ounces per ton. We expect to realise in this case also a good profit to the syndicate for the comparatively small sum which we have asked. We have taken small lines in other promising ventures, and are continually having good business offered. On the whole, I think you will agree with me that we have not been idle, and that we are well on the way to make a great success of the City and Colonial Syndicate. If there are any questions which any shareholder wishes to ask, I shall be happy to answer them.

Mr. KISSAM proposed a hearty vote of thanks to the Chairman and directors, which was seconded by Mr. O. H. BEATTY, and carried unanimously.

The CHAIRMAN, in acknowledging the compliment, said that he and his colleagues worked very hard, and wanted to make a very great success of the syndicate. He added that they would be glad if shareholders would assist them by introducing good business; they were prepared to deal with either mining or commercial enterprises.

The proceedings then terminated.

ST. JOHN DEL REY MINING COMPANY, LIMITED.

The 65th ordinary general meeting of the shareholders in the St. John del Rey Mining Company (Limited) was held on Thursday, at the Cannon-street Hotel, Mr. F. TENDRON presiding.

The SECRETARY (Mr. M. A. McCall) read the notice convening the meeting.

The CHAIRMAN, who was warmly received, said he proposed to ask their very careful attention that afternoon, because he had to deal at great length with figures which, however uninteresting, were all important to those who wanted to realise the real value of the property—what they had done in the past, and what they expected to do in the future. In the first instance he would deal with the yield—that was to say, the value of the gold got out of the mineral. Up to February 29 they raised 72,894 tons, or a monthly average of 6000 tons. This mineral, after being taken to the mill, was carefully examined, and the killas and the inferior stone was rejected to the extent of one-fifth. It was then lifted to the top of the mill, carried to the ore bins, and crushed to the finest powder. Afterwards it was passed with water over the straking floors, which obtained one-fifth of the whole of the mineral. One-fifth they expected to have, and they believed they had four-fifths of the whole of the original gold contents. (Hear, hear.) Now, the quantity so crushed amounted to 58,863 tons; of that they took one-fifth, about 12,000 tons, on to the straking floors to be reconcentrated, and about half the quantity was treated in barrels with quicksilver. The gold so obtained was sold, and produced for the whole quantity crushed an average per ton of 4s. He asked them to remember that they got 4s. a ton after throwing on one side one-fifth of the whole of the mineral. Then if they would have patience, he would go further and give them the result of 21 years' working. That was before they commenced working the new mine, eight years before the fire of 1867, and 13 years before the destruction of the mine by the fall of rock in 1886. They knew, if they had any experience of mining, that some hundreds of thousands were sometimes paid as the value of a property bought on samples weighing with the aggregate a ton. He could name them one grand mine, apparently, that had such a display of ore that it filled a jeweller's window. These samples were immensely rich, and over £100,000 was paid for the property, which did not produce as much as 5 tons out of the whole that was like the half-ton exhibited in the jeweller's window. But during the last 21 years they crushed 1,470,000 tons, or rather raised that quantity from the mine. He thought they would be satisfied that this was a very good basis to go upon. Well, they had gold from it amounting to £3,307,500, and a profit of £1,100,700. (Applause.) Now, the quantity crushed was 1,323,000 tons; therefore, only 10 per cent. was rejected, and yet they realised 50s. per ton by crushing the mineral. To recapitulate figures he wished to point out that during the past year they rejected 20 per cent. of the stuff, and had 4s. per ton, but during the last 21 years they rejected only 10 per cent., and had 50s. a ton. That was the problem that he wanted solved—Was it there? Was less gold there than there was before? They knew perfectly well that the lode varied at the different horizons, but one thing they always felt assured of was the astonishing regularity in the gold contents. The solution stared them in the face. It was this—during the past year they crushed nearly as many thousand tons a month as they did during any former period, but they did it with 80 stamps, whereas formerly they used 135 stamps. There, then, was the explanation—they did the same work with a smaller number of stamps, and, therefore, must necessarily crush faster. And crushing faster meant crushing coarser also. When he went out to the mine in 1880, their then reduction officer, Mr. Wenderborn, of whom he still entertained the highest respect, and who had had the greatest experience of crushing minerals, said one thing absolutely necessary was that the ore should be crushed very fine. And he proved what he said by taking 20 lbs. of concentrates, out of which quicksilver could not get any gold. He washed a great quantity in bats, but no gold appeared. Then he put the contents in a mortar, and pounded away at it for some minutes, after which he washed it in bats. This produced a beautiful hue of gold. Taking the gold off he washed the stuff again, but no gold appeared. Mr. Wenderborn, however, pounded it in the mortar, and washed it a second time, when another line of gold was produced. He repeated the operation a third time with the same result. The gold line, of course, became smaller each time, but Mr. Wenderborn said he believed if he had had the patience to pound the stuff again that another gold line would have been produced. Their gold was sometimes so fine that often 1,000,000 particles only weighed 1 grain. He did not, for one moment, wish them to think he was finding fault with the authorities at Morro Velho for crushing so freely, and crushing 2 tons with every stamp each 24 hours instead of only 1½ tons. They wished to make the mine pay, but there came the question of whether they liked a less percentage of gold out of a much larger quantity of mineral, or a larger percentage of gold out of a smaller quantity of mineral. Had they not have done so the working expenses would not have been paid, but the important point he wished them to realise in connection with this was that there was a large quantity of gold left in the concentrates. The accounts for the long period he had referred to gave the recovery of gold at 70 per cent. Now, if they got 50s. out of a recovery of 70 per cent., it meant that the original contents were 71 per cent., or worth 71s. During last year they rejected 20 per cent.; and, therefore, he did not think he would be far wrong in supposing that the original contents of the mineral were also about 71s. a ton. He thought he had pretty well proved this point. If so their recovery was 62 per cent., but they must remember that this would be increased by the second process. He himself was satisfied with the figures, but he did not ask them to accept them unless they pleased. Mr. Chalmers, in one part of his report, said that 65 per cent. by quicksilver amalgamation would be a good recovery. He did not, however, accept the figures given by the reduction officer, that the recovery during the past year was 70 per cent., because Mr. Chalmers said the original assays were not definite, and could not be relied upon until he had the automatic sampler to guide him. He was now going to leave the question of yield, except to ask them to bear in mind that Mr. Chalmers put the recovery at 76 per cent., and possibly 80 per cent. But he gave them his own figures. Coming to the cost in Brazil last year, this was 81s. per ton. The cost for the 21 years on the mineral crushed was 32s. per ton. Mr. Chalmers was working cheaper during the past year than the average yearly cost for the last 21 years. (Hear, hear.) If they took it on the cost of every ton raised, and that was the only fair way of putting it, the amount was 25s. a ton, against 30s., the average for the 21 years in spite of the very cheap labour they had in those days. Therefore, Where did the extravagance of Mr. Chalmers come in? where was there room to facilitate with him on the ground of expense? (Hear, hear.) The fact was that the wages paid for native labour in Brazil very much depended on what the natives could live on. They must have a living wage. The cost of living had so increased that a man getting four milreis now was no better than the man who used to get a milrei and a half when there was an Emperor of Brazil. The value of the milrei was a very important point, but they, as a company, were hardly justified in considering this matter. During last April its value was down as low as 8½d., and the result was that they worked the mine at a cost of only 22s. 8d. per ton raised. This was pretty well down to the 20s. which he used to give them as his estimate, and he did not despair that at some future date when things were really settled, and they could use drills instead of men, while the expense in the mechanics' department would also be less, that it would reach this figure. Then if 5s. per ton was the value of the yield, they would not go very far wrong, he did not think. But what would a yield of 5s. do for them when they were able to work the full 100 head of stamp, and get a monthly crushing of 6400 tons, and when the second process was put into operation. He was now giving them Mr. Chalmers' figures. He told them that he would have no difficulty in crushing 6400 tons a month, and hoped ultimately to recover 80 per cent. of the gold contents. He (the Chairman) put the gold recovery at 76 per cent., preferring to keep himself on the safe side. Well, if the monthly crushing was 6400 tons, that figure would give them £17,000. If they did not like his figures let them take Mr. Chalmers'—he put it at £15,000. Mr. Chalmers was very careful not to unduly raise their expectations. He could not get him to fix himself clearly to anything as to the time when the full complement of stamp would be at work, but they hoped it would be before the end of the year. He also could not get him to definitely say when the second process would be in operation, but he believed it would be a short period after the additional power was completed. This additional scheme was a splendid matter, and was very simple. Mr. Chalmers was going to dam the waste waters, which came from the streams after they had done their work, to a sufficient height that would enable them in the dry season to make it equal to 100 horse power, and in the wet season 150 horse power. This would be applied to a dynamo, which would be shipped next month. It was equal to 200 horse power, and would be transmitted by electricity to the motors, which would aid in the work being carried on at the mill. But one thing more than another that he would like to see done was the relieving of a portion of the work done by the transmission machinery. If the new machinery could be made to lighten the work of the transmission machinery, he should have been very glad indeed. He would tell them what that transmission machinery was, and what its duties were, for he believed that it was in consequence of this that a great deal of the cost of the mechanics' department had had to have been incurred last year. The transmission machinery was a big wheel which received its power from the Pelton wheel. The two were connected by means of an endless rope, and run through a shaft more than 200 feet in length; there were wheels at intervals along the shaft. It would have been a very simple matter if only the 100 stamps were driven by this machinery, but, in addition, it was used for hauling up all the tramcars from the adits to the mill, worked three stone-breakers, and took the mineral up to the top of the mill. Therefore, if anything went wrong the stamps had to be stopped working while repairs were done, and that was one of the reasons why they had not had the full 100 stamps at work. He hoped that Mr. Chalmers would not only use the additional power to put on additional strength to the stamp, but that he would also take off a portion of the duties of the transmission machinery, especially those of hauling up the tramcars and working the stone-breakers. He knew it was right, or a matter of economy, to only have one engine house, but he would rather have had two buildings, in order to have avoided the constant delays which had occurred from this cause. He did not find fault with Mr. Chalmers, but said he thought possibly it was a mistake of his in putting so much work on the transmission machinery. They had had to write to Mr. Chalmers rather unpleasant letters, in consequence of the pressure put upon them by certain shareholders in reference to the delay in realising the profits. Coming to the question of capital outlay, they would find in the balance-sheet that up to February 29 the sinking of two shafts 2400 feet, and erecting the necessary machinery, tramways, and other works, including over 40 miles of water courses, was £380,562. They had still more some money to spend in deepening the shafts to the No. 9 horizon, which would bring their complete capital outlay on the mine and works to under £150,000. Now, had they any mine to compare this with. Fortunately there was, and Mr. Hamilton Smith, one of the greatest mining engineers that ever lived, writing to the *Times* in 1895, estimated the cost of sinking two shafts from 2500 feet to 3000 feet, with all the necessary plant, in the Witwatersrand field at £600,000. And Hatch and Chalmers, in their well-known book on South Africa, put the cost of sinking a shaft 2500 feet with proper mill and the necessary surface works and developments, before any return could be made, at £650,000, and £100,000 for interest during construction. Again, one of the best deep level mines in South Africa, whose capital stood at 1200 per cent. premium, had already spent £240,000 in sinking down 1150 feet and erecting the necessary plant, and were going to raise another £250,000 more capital to complete the shafts. To put up the mill and complete the developments would cost £600,000. Therefore, he thought they should give justice to Mr. Chalmers for having completed their works for less than £450,000. Of course, he did not include the purchase money for the property in any of the estimates he had given. Then let them look at the reserves they had got. They had above the timber level at least 300,000 tons, and if the developments below continued, as they had every reason to expect they would, to the No. 9 level, there was another 500,000 tons of mineral in the mine (Applause). What a different position the company was now in to what it was in the year 1866. That was the time when the company was at its zenith, 60 per cent. dividend were paid, and £15 shares stood at £60, the capital being £165,000. Multiply this by four, and they got £666,000 as the value the Stock Exchange then put on the property. Then they had no known reserves, for they worked the mine downwards, believing that the mine would go on all right. To-day with known reserves the property stood at the same price, and was never before in such a safe position. They now ran no risks, except the ordinary shares, such as accidents on the surface, watercourses, or fire, but they were very improbable. Never again had they the risk of seeing the mine shut up for seven years, as it was in 1867, or for 10 years, practically as it was in 1886. He also wished them to realise the immense importance of the second process. On the Crown Reef, one of the best mines in South Africa, the crushing of 6000 tons for the month of April made a profit of £16,000, but of that only 5s. 8d. in every £ came from the first process. The other 1s. 6d. came from the second process. Although their profits might not be satisfactory at the present moment, he asked them to remember what the value of the property would doubtless be in the future. Let them be prepared for fluctuations in the monthly yield, and not value the mine according to the Stock Exchange value put on it, but, guided by the long experience they had had of the property, form a reasonable opinion for themselves. With regard to

mation would be a good recovery. He did not, however, accept the figures given by the reduction officer, that the recovery during the past year was 70 per cent., because Mr. Chalmers said the original assays were not definite, and could not be relied upon until he had the automatic sampler to guide him. He was now going to leave the question of yield, except to ask them to bear in mind that Mr. Chalmers put the recovery at 76 per cent., and possibly 80 per cent. But he gave them his own figures. Coming to the cost in Brazil last year, this was 81s. per ton. The cost for the 21 years on the mineral crushed was 32s. per ton. Mr. Chalmers was working cheaper during the past year than the average yearly cost for the last 21 years. (Hear, hear.) If they took it on the cost of every ton raised, and that was the only fair way of putting it, the amount was 25s. a ton, against 30s., the average for the 21 years in spite of the very cheap labour they had in those days. Therefore, Where did the extravagance of Mr. Chalmers come in? where was there room to facilitate with him on the ground of expense? (Hear, hear.) The fact was that the wages paid for native labour in Brazil very much depended on what the natives could live on. They must have a living wage. The cost of living had so increased that a man getting four milreis now was no better than the man who used to get a milrei and a half when there was an Emperor of Brazil. The value of the milrei was a very important point, but they, as a company, were hardly justified in considering this matter. During last April its value was down as low as 8½d., and the result was that they worked the mine at a cost of only 22s. 8d. per ton raised. This was pretty well down to the 20s. which he used to give them as his estimate, and he did not despair that at some future date when things were really settled, and they could use drills instead of men, while the expense in the mechanics' department would also be less, that it would reach this figure. Then if 5s. per ton was the value of the yield, they would not go very far wrong, he did not think. But what would a yield of 5s. do for them when they were able to work the full 100 head of stamp, and get a monthly crushing of 6400 tons, and when the second process was put into operation. He was now giving them Mr. Chalmers' figures. He told them that he would have no difficulty in crushing 6400 tons a month, and hoped ultimately to recover 80 per cent. of the gold contents. He (the Chairman) put the gold recovery at 76 per cent., preferring to keep himself on the safe side. Well, if the monthly crushing was 6400 tons, that figure would give them £17,000. If they did not like his figures let them take Mr. Chalmers'—he put it at £15,000. Mr. Chalmers was very careful not to unduly raise their expectations. He could not get him to fix himself clearly to anything as to the time when the full complement of stamp would be at work, but they hoped it would be before the end of the year. He also could not get him to definitely say when the second process would be in operation, but he believed it would be a short period after the additional power was completed. This additional scheme was a splendid matter, and was very simple. Mr. Chalmers was going to dam the waste waters, which came from the streams after they had done their work, to a sufficient height that would enable them in the dry season to make it equal to 100 horse power, and in the wet season 150 horse power. This would be applied to a dynamo, which would be shipped next month. It was equal to 200 horse power, and would be transmitted by electricity to the motors, which would aid in the work being carried on at the mill. But one thing more than another that he would like to see done was the relieving of a portion of the work done by the transmission machinery. If the new machinery could be made to lighten the work of the transmission machinery, he should have been very glad indeed. He would tell them what that transmission machinery was, and what its duties were, for he believed that it was in consequence of this that a great deal of the cost of the mechanics' department had had to have been incurred last year. The transmission machinery was a big wheel which received its power from the Pelton wheel. The two were connected by means of an endless rope, and run through a shaft more than 200 feet in length; there were wheels at intervals along the shaft. It would have been a very simple matter if only the 100 stamps were driven by this machinery, but, in addition, it was used for hauling up all the tramcars from the adits to the mill, worked three stone-breakers, and took the mineral up to the top of the mill. Therefore, if anything went wrong the stamps had to be stopped working while repairs were done, and that was one of the reasons why they had not had the full 100 stamps at work. He hoped that Mr. Chalmers would not only use the additional power to put on additional strength to the stamp, but that he would also take off a portion of the duties of the transmission machinery, especially those of hauling up the tramcars and working the stone-breakers. He knew it was right, or a matter of economy, to only have one engine house, but he would rather have had two buildings, in order to have avoided the constant delays which had occurred from this cause. He did not find fault with Mr. Chalmers, but said he thought possibly it was a mistake of his in putting so much work on the transmission machinery. They had had to write to Mr. Chalmers rather unpleasant letters, in consequence of the pressure put upon them by certain shareholders in reference to the delay in realising the profits. Coming to the question of capital outlay, they would find in the balance-sheet that up to February 29 the sinking of two shafts 2400 feet, and erecting the necessary machinery, tramways, and other works, including over 40 miles of water courses, was £380,562. They had still more some money to spend in deepening the shafts to the No. 9 horizon, which would bring their complete capital outlay on the mine and works to under £150,000. Now, had they any mine to compare this with. Fortunately there was, and Mr. Hamilton Smith, one of the greatest mining engineers that ever lived, writing to the *Times* in 1895, estimated the cost of sinking two shafts from 2500 feet to 3000 feet, with all the necessary plant, in the Witwatersrand field at £600,000. And Hatch and Chalmers, in their well-known book on South Africa, put the cost of sinking a shaft 2500 feet with proper mill and the necessary surface works and developments, before any return could be made, at £650,000, and £100,000 for interest during construction. Again, one of the best deep level mines in South Africa, whose capital stood at 1200 per cent. premium, had already spent £240,000 in sinking down 1150 feet and erecting the necessary plant, and were going to raise another £250,000 more capital to complete the shafts. To put up the mill and complete the developments would cost £600,000. Therefore, he thought they should give justice to Mr. Chalmers for having completed their works for less than £450,000. Of course, he did not include the purchase money for the property in any of the estimates he had given. Then let them look at the reserves they had got. They had above the timber level at least 300,000 tons, and if the developments below continued, as they had every reason to expect they would, to the No. 9 level, there was another 500,000 tons of mineral in the mine (Applause). What a different position the company was now in to what it was in the year 1866. That was the time when the company was at its zenith, 60 per cent. dividend were paid, and £15 shares stood at £60, the capital being £165,000. Multiply this by four, and they got £666,000 as the value the Stock Exchange then put on the property. Then they had no known reserves, for they worked the mine downwards, believing that the mine would go on all right. To-day with known reserves the property stood at the same price, and was never before in such a safe position. They now ran no risks, except the ordinary shares, such as accidents on the surface, watercourses, or fire, but they were very improbable. Never again had they the risk of seeing the mine shut up for seven years, as it was in 1867, or for 10 years, practically as it was in 1886. He also wished them to realise the immense importance of the second process. On the Crown Reef, one of the best mines in South Africa, the crushing of 6000 tons for the month of April made a profit of £16,000, but of that only 5s. 8d. in every £ came from the first process. The other 1s. 6d. came from the second process. Although their profits might not be satisfactory at the present moment, he asked them to remember what the value of the property would doubtless be in the future. Let them be prepared for fluctuations in the monthly yield, and not value the mine according to the Stock Exchange value put on it, but, guided by the long experience they had had of the property, form a reasonable opinion for themselves. With regard to

the water in the mine, Mr. Chalmers told them that he was lowering it 3 and 4 feet a day. Although Mr. Chalmers had not cabled them particulars of good returns to be laid before the meeting, he was working the mine for the safe and permanent prosperity of the company, and he (the speaker) appreciated his courage for thus showing so clearly what he thought his duty should be. The Chairman then moved the adoption of the report and accounts.

Sir JOHN SWINBURNE, Bart., seconded the resolution.

Mr. BOSANQUET said although on a previous occasion he called the Chairman a wet blanket, at this meeting he felt inclined to say he had not been wet enough. It was very distressing to the shareholders to know they had been within touch of, perhaps, the greatest gold mine in the world for a very considerable period, and whereas a year ago he said that their dividends were being dangled before them like a "will o' the wisp," there was no pretence for saying so that day, as the Chairman had himself admitted that they were not to look for immediate profitable results. While expressing the greatest confidence in the directors, he was strongly of opinion that a message should be sent out to Mr. Chalmers to the effect that, much as they admired his ability, he had disappointed them, and that they looked to him to put that great enterprise on the footing they were led to believe it would be a year or 18 months ago. (Applause.) He congratulated the board on not having to call for any more money at that meeting, but considered that shareholders had a right to complain that the dividend which was promised last year was not forthcoming.

The CHAIRMAN said Mr. Bosanquet's remarks would, doubtless, do a great deal of good. They would send Mr. Chalmers a report of the meeting, but, practically, he had heard their views already. He was aware that the shareholders were discontented.

The resolution was then put, and carried unanimously.

The CHAIRMAN next moved the re-election of Mr. S. H. ILLINGWORTH, the retiring director. He said they might be sure the directors did not lose sight of the question of paying dividends. But they must remember the interest on the bonds cost them £2000 a month, and, perhaps, as the time went on shareholders would find the money to pay off these.

Mr. ALFRED DRIVER seconded the motion, and it was agreed to.

Mr. ILLINGWORTH briefly replied.

A SHAREHOLDER asked whether the debentures were terminable, and if so did the directors look forward to the shareholders paying them off.

The CHAIRMAN said the bonds were terminable on September 1, 1897, in the sense that up to then the holders had the right to convert them into shares. When the option ceased the directors had the right, if they thought proper, to find the money to pay them off. He expected that the company would be in a very different position when the time came, and that the bondholders would desire to convert their holding. At any rate, if not, they would be very glad to renew them at 7 per cent. instead of the very high rate of 10 per cent., and which they had to pay when the company

With regard to the financial syndicate mentioned, our interest in that consisted more of the nature of advancing money to the promoters than anything else. The Cripple Creek Pioneers (Limited) was not floated directly by this syndicate, but, through our having assisted in the financial promotion of it, we have received a very large consideration. We have about 1000 shares of the Cripple Creek Pioneers, and as you know from the quotation in the papers those are being dealt in at £2 per share at the present moment. We have also received a considerable cash bonus on the transaction, and I think, as far as the syndicate is concerned, the transaction was an eminently satisfactory one. With regard to the various shares which this syndicate holds in other companies, of course, as you know, our largest holding is in the Great Talunga. The Great Talunga looks at the present moment as if it were on the point of turning into a dividend-paying mine. Probably most of you are shareholders in that property, or, at any rate, a large number of you, and you will have received from the board of the Great Talunga a series of extracts concerning the developments which are taking place there. The latest information we have received is to the effect that, as soon as a battery can be erected, there will be very little need for any further expenditure on the part of the Great Talunga Company, as the property will then be made to pay its way. The manager has under offer a complete crushing and treating plant, and only yesterday, I believe, he was cabled to purchase and erect it with all possible speed. With regard to the pumping machinery which was sent out to the property some little time ago, the board of the Talunga received a cablegram stating that all the machinery had now been erected. The exact wording of the cablegram is as follows:—"Main shaft. Water now in fork. New machinery works well. A rich, well-defined lode. Confident it will be a great success. Am sinking on the course of the lode." That is a satisfactory position. In addition to that, in the western shaft the present managers have opened up what looks like a very fine payable reef, measuring from 5 to 10 feet in width, and carrying visible gold throughout. They have sent various samples to be treated at different reduction works, and I may tell you that the results of those samples have been all that could be desired. I do not think this syndicate need fear as to the eventual profit which it will derive from holding shares in the Great Talunga Gold Mine. With regard to the future, as I have already intimated, we have at the present moment under offer two satisfactory pieces of business, as far as we can judge at present. We shall, of course, have to make very careful enquiry before we definitely decide to take them up. As you know, the past six months has been a very unfavourable time for gold mining promoters, and I think it must be considered as satisfactory that this syndicate has managed throughout those six months to do a business which enables us to pay a dividend, to say nothing of being able to carry such a large and satisfactory amount to the reserve fund.

Mr. JOHN HAMILTON seconded the motion.

Mr. BURGOYNE WATTS asked if the dividends would be paid in cash.

The CHAIRMAN said the preference share dividend would be paid *in toto* in cash, while the deferred share dividend would be paid as to 20 per cent. in cash and as to 30 per cent. in fully-paid shares. At the same time, the directors proposed, if those entitled to dividends cared to do so, to accept a call from the shareholders of the shares which they would receive in dividend at par value. He referred, of course, to the Great Talunga shares. Replying to a further question, the Chairman stated that £20,000 was brought forward from the previous half-year, and, therefore, their actual profit for the past six months was £1888. The whole amount had been made during the past year.

The motion was carried unanimously.

The CHAIRMAN, in moving that the dividends now proposed be confirmed, repeated his statement as to the option, and added that the board were now engaged in forming what was commonly known as a pool or a trust in the shares of the Great Talunga Company in order that they might co-operate with the other large shareholders in the property, seeing that it was likely to turn out so satisfactorily. The board were prepared to receive a call of the shares at par for a period of three or four months, and he thought there was little doubt that those shares would be entirely realised during that time if the shareholders desired to realise. At the same time, he might mention that the syndicate proposed setting aside a large block of the shares with a view of keeping them as a permanent investment.

Mr. W. PATON SUTHERLAND seconded the motion, which was agreed to.

A SHAREHOLDER expressed some disappointment that the dividend on the deferred shares was not to be paid wholly in cash.

The CHAIRMAN said as far as the deferred shareholders were concerned, this was only an interim dividend, and the directors hoped to be in a position to declare another dividend before the expiration of six months. He did not wish to commit himself to that, but threw it out as a hint from what took place when the question was discussed at the board meeting.

Mr. EVANS proposed, and Mr. ROSS seconded, the re-election of Mr. Frederick L. Burnside as auditor of the company, which was agreed to.

The proceedings then closed with a vote of thanks to the Chairman.

BRITISH BROKEN HILL PROPRIETARY COMPANY.

The adjourned ordinary general meeting of the shareholders in the British Broken Hill Proprietary Company was held on Thursday, at Winchester House, E.C., Mr. E. RUSSELL ROBERTS presiding.

The CHAIRMAN, in moving the adoption of the report and accounts, said considerable bodies of ore were in sight, and a large amount of exploratory work had been done. Their investments had turned out very profitable, they having gained by this means about £2000.

Mr. HENRY BRANDON seconded the resolution, and it was carried unanimously.

The CHAIRMAN then proceeded to deal with the present position of the mine and the company. A gentleman who had recently been on the property stated that there were 550,000 tons of ore in sight or at grass. The mine was now fitted with electric light, a rock-drilling apparatus, and, most important of all, Hancock's concentrating plant. The quality of the work and the capacity of the plant was of the very best description. It was originally intended to deal with only 1500 tons of ore a week, but it was now capable of dealing with 3000 tons in that space of time. On June 17 a cablegram was received from the mine to the following effect:—"Mill started; running well," and on June 19 they had another cablegram, reading:—"Mill running most satisfactorily. Carbonate concentrates assay give 72 per cent. lead, 5 ounces of silver." This concentrating plant had been adopted at several other mines, and mining opinion out in the colonies was extremely favourable to this system of treating ore. Two years ago their shares were extremely depreciated because, although they were turning out plenty of ore, they could not make it pay, and the shareholders felt that there was very little hope in the concern. With this new system, however, they hoped to get very good results. Their plant was capable of dealing with 150,000 tons of ore per year, and their only anxiety would be to get enough ore from their own developments. There was no doubt that the Adelaide directors deserved the best thanks of the shareholders for the time and trouble they had expended in getting this plant. They would, doubtless, be anxious to know what was likely to be the result of fitting up this concentrating plant. They appeared to have about 70,000 tons of carbonate ore in sight and at grass. The average estimated net profit per ton of this ore they considered to be about 12s. or 14s. The sulphides yielded an estimated net average profit of 10s. or 12s. per ton. If they only treated 100,000 tons of ore per year, that would give them a profit of some £200,000 per year. They might

confidently say, therefore, that they had that profit immediately in front of them.

A vote of thanks to the Chairman concluded the meeting.

TRUST FRANCAIS, LIMITED.

The statutory general meeting was held on Thursday, at Cannon-street Hotel, E.C., under the presidency of Mr. H. E. M. DAVIES (the Chairman of the company).

The SECRETARY (Mr. R. F. S. Pearson) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—As you are doubtless aware, this meeting is simply called to comply with the English Joint Stock Companies Act, which provides that the company must hold a meeting within four months from the date of its registration, and there is no formal business—indeed, no business at all—to put before you. The Trust Francais (Limited), as the name implies, is a French company registered in England. The capital of the company, which has been subscribed, is 250,000 preference shares of £4 each and 250,000 ordinary shares of 1s. each, and is principally held in France and Belgium, with the exception of the Consolidated Gold Fields. There are also 50,000 shares of each class held in reserve for future issue. I have said that the company is a French one, and to comply with the requirements of the French market all the share certificates, which in England are usually registered in the names of the holders, are made bearer warrants. The expense of these warrants is now being paid by the company here again to conform as much as possible to the French requirements, and the cost will be deducted from the first coupons paid in respect of dividends on these share warrants. The directors are principally composed of French gentlemen, and I will give you a list of them. Baron Robert Oppenheim, Mr. M. de St. Quentin, Comte de Bondy, and Mr. Grebert Borgnis in Paris, and two gentlemen from Belgium, where many shares are held. They are Baron F. de Macar and Mr. H. Warnant; and England is represented by the Earl of Chesterfield, Mr. J. Vieira, and myself. The principal office is situated in Paris. The business of the company is to invest in the best class of Witwatersrand stocks, and the Consolidated Gold Fields of South Africa (Limited), in London and Johannesburg, have been appointed advisers, the Trust Francais acting as agents to the Gold Fields Company in Paris. I have told you the subscribed capital is £1,012,500, of which £800,000 has already been invested—judiciously invested—in the best class of stocks in the Transvaal, and although prices are not at a very happy level to-day, still we have been able to invest so that I am glad to say there is a considerable profit or to-day's prices. I do not think there is anything more to trouble you with; but if any shareholder would like to put a question I shall be glad to reply to the best of my ability.

A SHAREHOLDER: I beg to propose a vote of thanks to the Chairman, and I am glad to learn from his lips that there has been a profit on our investments.

The motion was seconded and carried, and, after being briefly acknowledged, the proceedings then terminated.

KLERKS DORP GOLD AND DIAMOND COMPANY (LIMITED).

The first annual general meeting of shareholders in the Klerksdorp Gold and Diamond Company (Limited) took place on Wednesday, at the Cannon-street Hotel, the chair being occupied by Mr. D. McDonald. In moving the adoption of the report and accounts, the Chairman said the manager's report gave every possible detail on the works carried out at the mine that there was very little left for him to say on the subject. They had every reason to expect at the last meeting that long before this the works would have been in full operation, but it having been found out that the direct cyanide process was the best for working their ore, it had been decided to erect the necessary plant for this purpose. The contract had been given out, and they ought, in a very short time, to be winning gold. They would then be in a position to establish the value of the property, and, having a large area, would be able to promote subsidiary companies for the development of portions of the ground. Diamonds were first discovered in the mill, but further search had been discontinued until they had proper control over the unenclosed ground.—Mr. C. J. Posno seconded the resolution, and, after a short discussion, it was carried unanimously.—Mr. M. W. Colchester-Wemyss was reappointed a director and Mr. F. W. Lord auditor, after which the meeting concluded.

HANNAN'S MOUNT FERRUM GOLD MINES (LIMITED).

The statutory meeting of the shareholders in Hannan's Mount Ferrum Gold Mines (Limited) was held on Monday, at the offices of the company, Dashwood House, E.C., when Mr. James Head, who presided, stated that in his opinion they had secured a very valuable property. Mr. G. Arrows, the manager, telegraphed as follows:—

"Lease 1490 E, shaft No. 1, crosses to the west 125 feet. The country rock is highly mineralised; there is nothing to show we are yet near the lode.—Underlie shaft, 125 feet carried down. On the hanging wall lode in several places has opened up 8 feet in width; we have not so far met with the footwall; lode one of the most promising in this district; average may be taken at 4 ounces; last 15 feet with best prospects; running still on the footwall side. Shaft No. 3 sunk in country rock 65 feet. Lease 1111 E south, adjoining.—A very powerful lode discovered at a depth of 130 feet, 18 feet in width—2 ounces. Shaft 200 feet, 70 feet south of southerly boundary. Lease 1490 E—Lode bears 20° to the west of underlie shaft; there is a great extent of it in Lease 1490 E; have fixed the position of main shaft to command these lodes. Lease 1110 E, crosses to the east 140 feet; passed through lode 3 feet in width—2 ounces. 170 feet east hanging wall lode; drove 7 feet in driving south on the hanging wall side 20 feet in; several places show lode 8 feet; we have not, so far, met with the footwall; worth 30 dwt. Crosscut to the west 106 feet; have east vein worth 2 ounces 3 feet in. Lease 987 E—Have fixed the position of main shaft to command lodes. Steam winch erected; condenser working; pushing developments; the prospects generally continue to improve beyond my anticipations."—A vote of thanks to the Chairman concluded the meeting.

NEW PINOS ALTOS COMPANY (LIMITED).

The fourth ordinary general meeting of shareholders in the New Pinos Altos Company (Limited) was held on Monday at the Cannon-street Hotel.—The Earl of Onslow, who presided, in moving the adoption of the report and accounts, said that the company had never entered upon a year under better auspices than it did in 1895. The first consignment of bullion, which was sent out in February, was \$75,000. If that had been maintained they would have realised some \$750,000 instead of \$432,000, as they had done. No sooner, however, had they plenty of ore to work upon, and a sufficient number of miners to perform the necessary operations, than a disastrous fire broke out. These troubles, however, had now been got over, and there was every reason to believe that for some time to come the mill would be running at full speed. Although they did not pretend to be satisfied with the results of the year, they could not help feeling the same confidence in the concern as they had felt hitherto. There was, they knew, a fine body of ore in the mine, which only needed to be extracted to yield a very handsome profit, so that unless something very extraordinary were to occur, they would find that the property would turn out to be a very valuable one in the future.—Mr. J. M. Paulton seconded the motion for the adoption of the report and accounts, which was carried unanimously.

WHITE FLAG CONSOLS GOLD MINES (LIMITED).

The statutory meeting of shareholders in the White Flag Consols Gold Mines (Limited) was held on Thursday at Winchester House, Mr. Samuel De Lissé, who presided, said that the company was

registered on February 25, with a capital of £130,000, of which £90,000 was offered for subscription, all of which was allotted. The working capital of £30,000 was practically intact. The proper lessees were reported on by Mr. Ramage, Mr. Becke (a first-class mining engineer in Coolgardie), and Mr. John McDermott (of the New Zealand School of Mines), and from their reports it appeared that they comprised 51 acres, being known as the Limerick Consols, Limerick North, and Hurly Burly, with certain lease numbers attached to them; also that there were six distinct parallel and separate lines of reef, varying from 2 feet to 13 feet in width, forming large and compact bodies of ore, rich in gold, in good country. These reports fully bore out the anticipations which had been formed respecting the property, and everything pointed to their turning out very satisfactorily indeed.—A vote of thanks to the Chairman terminated the proceedings.

LADY MARGARET GOLD MINING COMPANY (LIMITED).

The statutory general meeting of the shareholders in the Lady Margaret Gold Mining Company (Limited) was held on Thursday at Winchester House, E.C., when Mr. L. A. Aaron, who presided, stated that during the short time the company had been in existence the directors had done everything in their power to initiate the equipment of and arrangements at the mine. Local agents had been appointed, and also a competent manager, who on May 16 reported very favourably on the property. The latest news by cable was as follows:—"May 18: Struck a good body of ore; other workings looking well." June 2 (extract from telegram received from manager):—"Bottom workings are looking exceedingly well." June 16 (cablegram from local agents):—"Margaret registration certificate issued. All is now in order." This referred to the title of the property. June 22:—"On the whole, there is a decided improvement since last report." The meeting concluded with a vote of thanks to the Chairman and directors.

VILLAGE MAIN REEF MINING COMPANY (LIMITED).

An extraordinary general meeting of the shareholders in the Village Main Reef Mining Company (Limited) was held on Wednesday, at the Cannon-street Hotel, Mr. W. H. Frith presiding, for the purpose of confirming the resolution, passed at the meeting held on June 4, increasing the capital of the company, will be increased to £230,000 by the creation of 50,000 new shares of £1 each. The Chairman formally moved the confirmation of the resolution.—Major Ricard Seaver seconded the motion, and it was agreed to.—The meeting then terminated.

MINING IN CORNWALL AND DEVON: NOTES ON MINING IN THE WEST.

(FROM OUR OWN CORRESPONDENT.)

THE better tone of the Cornish Share Market to which we called attention last week has undoubtedly continued, and mining matters are once more becoming talked of among people generally in the westernmost county. Already there is an absence of sellers of stock, and though the buying orders may not yet have been great there are sufficient indications of the indisposition which holders have to part with any of their shares. And it is only natural. They have been for the most part holding their shares at a considerable risk, and have been paying up fairly heavy calls, and it is not to be expected that they are going to part at the bid of the first man who thinks he can foresee an advance. We are speaking, of course, of the shares in the principal mines of the district, and, unfortunately, they are now very few. If, however, in Cornish mining the fittest have survived, then all that remain after so severe a depression must be considered the pick of the mining properties of the county. Some shares are, however, exceedingly sensitive, and none more so than Dolcoath, in which at any time there may be a boom. East Pools are also better on the prospect of some settlement of its troubles. With the approach of West Kitty meeting, there is also an inquiry for shares, with the inevitable result that the price has been enhanced on very little actual business. The tin market is being watched in Cornwall just now with greater anxiety and curiosity than for some time, and there is a fixed belief that the patience with which shareholders have played the waiting game will be amply rewarded.

In the mines themselves very little of moment has taken place. Wheal Kitty shareholders have again most contentedly agreed to put their hands in their pockets for a 5s. call. The mine certainly has been disappointing, but there is now the definite and unmistakeable statement of the responsible officials that sufficient tin is in sight to ensure their at least meeting costs between now and the next meeting. It is remarkable what prejudice seems to have been shown against the use of the rock drill at St. Agnes, but probably the experiment of Wheal Kitty will serve to bring it into more general use. At any rate, the drill which has been in operation there for the last few months is to be continued, and it will be surprising if it does not well repay its cost in the rapidity with which speculative points of importance may be opened up. The outlook at Wheal Kitty is very encouraging. The tendency in the Camborne and Redruth district is to increase the rock-drilling machinery, and the Bassett Mines Company have just entered into an arrangement with the Tuckingmill Foundry Company, by which the latter company will drive 2000 fathoms of ground for them. The contractors will themselves put up a compressor capable of driving eight drills, and it may be found necessary to increase the power available, in which case the machinery will be duplicated. Wheal Grenville also needs some addition in this direction, and it is to be hoped that the management will not allow the grass to grow under their feet. What they want in a mine of the extent and importance of Grenville is a duplicate of that put up by Holman Bros. at Carn Brea, although a smaller compressor might perhaps answer their requirements. There was, we believe, a half promise at the meeting in Cornwall recently that the matter should not be lost sight of, and in spite of the disidence which the committee would naturally have to make a call, yet the ready manner in which shareholders always put their hands in their pockets to fall in with the progressive ideas of the management, should assure them that they need have no fear in giving the order for the plant necessary to more efficiently equip the mine.

We understand that the arrangements for restarting the celebrated Great Work Mines, in the parish of Breage, are now complete, very satisfactory terms with the lords having been secured. Operations will very shortly be commenced, and it is hoped that at last a fair trial will be given to this historic sett, which in its time was a great tin producer, though not sunk to much more than half the depth of the principal mines in the Camborne district. The Great Work ore is extremely rich, and always commanded a high price at the smelters when last the mines were worked. In the opinion of many experts, Breage offers an even better field for the judicious investment of capital than Camborne and Redruth.

COMPLIMENTARY DINNER TO MR. PRITCHARD-MORGAN.

ON Wednesday night Mr. Pritchard-Morgan, M.P., was entertained on his return from Western Australia, to a dinner given in his honour at the Savoy Hotel, by the London and West Australian Mines and Finance Agency (Limited) and the British West Australian Mines and Share Corporation (Limited).

Sir WILLIAM INGRAM, Bart., occupied the chair, and was supported by Mr. Henniker-Heaton, M.P., Mr. W. Allen, M.P., Mr. D. Randall, M.P., Dr. Lindsey, Sir J. Linton, the Hon. F. B. Hanbury-Tracy, Captain Pavay and Mr. Zebina Lane. About 100 guests were present all.

The loyal toasts having been enthusiastically honoured, The CHAIRMAN rose, amid cheers, and proposed the toast of the evening. He said: "Welcome to our friend, Mr. Pritchard-Morgan." (Cheers.) It is a strange thing to contemplate that, whereas throughout different parts of the world we hear of waves of depression and of almost ruin and loss, yet in this country—this small island on the map of the universe—we cannot complain, in any part of its history, that we have really suffered from any depression of trade or any failing off of the great wealth of the country, and I venture to say we can attribute this state of affairs to the fact that throughout the whole world we have ramifications which have been extended from this small centre, and which have had the natural result of returning to this centre the wealth which has been accumulated at the ends of the earth. (Cheers.) And it is to such men as our friend Mr. Pritchard-Morgan, who is a very typical instance of what our pioneers in distant countries can do for the Mother Country, that we can trace our present prosperity. There is not the least doubt that England is a magnet—not an ordinary magnet which attracts only iron—that attracts, by some special innate faculty of itself, the gold of the world, and it is to such men as Mr. Pritchard-Morgan that we may attribute this extraordinary magnetic influence which has been the cause of the accumulation of the prosperity of this country. As a lad Mr. Pritchard-Morgan went to lands far distant—lands which, in those days, were much further from us than they can ever be again, on account of the facilities now afforded to us in the way of steam and other means of transit; and in those days to go to Queensland and Australia was to go to the ends of the earth. He and others went out to develop the hidden wealth of those countries, and it is to those men, who were characterised by extraordinary energy and intelligence, that we owe much of the present prosperity of this country. Well, Mr. Morgan's merits were recognised, and he was returned to the most important post to which any man can possibly attain. Moreover, he still holds the confidence of his fellow-countrymen, being still a member of the British House of Commons. (Cheers.) He is not only a distinguished member of the House of Commons, but, beyond that, he is an Australian, a Welshman, and an Englishman combined. (Cheers.) Unlike many colonists, who simply come home to expend the wealth they have accumulated in other lands, and enjoy themselves in this country, he, upon returning to England, devoted his extraordinary energies to developing what I may call the hidden treasures of this country. (Cheers.) It is through the efforts of Mr. Pritchard-Morgan that in recent years our Royal Family have not had to go to Australia, California, or South Africa for their wedding rings, but have been able to obtain rings—as the daughter of the Prince and Princess of Wales will obtain hers—made of British gold. (Voices: "Welsh gold!") Gentlemen, Welsh gold is British gold. (Cheers.) We are assembled to-night to welcome Mr. Morgan on his return from West Australia—and his return, I am glad to say, in perfect health. Like the foxhound, he is keen upon the scent, and goes straight upon the right line, and he was able to appreciate the fact that West Australia was a country which was deserving of the attention of all those capitalists and all those enterprising gentlemen in London who were desirous of developing the resources of our colonies. (Cheers.) For that reason, it was not long before he elected to devote his time and money to going to Western Australia, there to prove to us what had already been to some extent shown, that Western Australia was a very possible and probable source of enormous return to this country for any capital invested there. I am glad to say that Mr. Pritchard-Morgan has returned from Western Australia, I do not know whether all gentlemen here are interested in those companies as I am, in which Mr. Pritchard-Morgan has placed his own money, and in connection with which he intends to devote his energies; but whether you are or not, I think you will all be interested to know that, as a result of the attention and energy Mr. Morgan has devoted to mining interests in Western Australia, it is, I believe, his intention to offer several valuable properties to the British public. It is not for me to utilise this assemblage as a means of advertising any companies about to be brought forward; but I have not the slightest hesitation in saying that, so far as I am concerned, I have every confidence in Mr. Morgan. (Cheers.) If he brings forward a property which, in his opinion, is a good one, and in which he has invested his own money, I am confident that that company is very likely to succeed. I now, in your name, offer a most hearty welcome to Mr. Pritchard-Morgan on his return, and ask you to rise and drink "Success and long years of health to our friend, Mr. Pritchard-Morgan." In a word I will say he has been one of the earliest pioneers of gold mining in Queensland, a recent pioneer of gold mining in Wales, and I believe he will be a future pioneer of gold mining in Western Australia. (Loud cheers.)

The toast was received with musical honours. Mr. PRITCHARD-MORGAN, M.P., who was received with loud cheers, said: I, necessarily and naturally, feel very proud in having been honoured, as I have this evening, by the presence at this table of so many distinguished gentlemen, representing varied interests in all parts of the world. In my little way, I have endeavoured to do my level best. I have not always succeeded; but I have sometimes succeeded, and, like many of my friends at this table—friends of many years standing—I have made fortunes and I have lost them and I have made them again, and I hope I will lose them again. (Laughter.) I do not know whether there is anything more pleasurable in this world than losing money, except it be making it. Making money is exceedingly pleasant; but spending it, to my mind, is equally pleasant, provided you do it in the way which does no harm to anybody, and does good to a great many people. (Applause.) Nothing delights me so much as to go into a district where labour is plentiful and work scarce, and to leave it when work is plentiful and labour scarce—to go into a district where men are in want of employment at low wages, and leave it when they obtain employment with higher wages. . . . one this in more parts of the world than one, u' f' may be able to contribute towards it again! (Applause.) I am rather in a difficulty this evening, because I scarcely know what to say. If I say nothing I shall be blamed, and if I say anything in particular I may also be blamed, because I shall be told that I have an axe to grind. ("No!") I really have no axe whatever to grind this evening: I am here as the guest of a great number of distinguished gentlemen not only belonging to the City of London, but other parts of the world, and I am very glad to see around me old friends of many years standing, friends of short standing, and gentlemen I have never had the honour of meeting before, but whom I hope I may have the honour of meeting again, under equally happy auspices. We have here this evening a great many distinguished gentlemen. We have Mr. Johnson, who was for some years minister of a large population of the West Australian Continent, known as the Northern Territory, which population will, I am sure, in the near future be able to give a fair account of itself. We have also here several members of Parliament, colleagues of mine, who have accepted an invitation of the directors to come here to do honour to me. We have likewise present Mr. Zebina Lane, who is manager of the most prominent mine to-day in the English market. We have also here Mr. David Lindsey, a distinguished

Australian explorer, who has done good work in the past and is doing good work now, and who is young enough to do still more work in the future. We have other gentlemen here whose names I will not mention, because I know that they are rather sensitive of being referred to at public gatherings such as this; but I see smiling half way down the table a very old friend I met at Charters Towers some years ago, and he did me an honour, when he was a distinguished member of the English bar—which profession he has abandoned, perhaps, for a more congenial field—when, as an author, he made me one of the leading characters of the book he wrote on Australian travels. (Laughter.) It was in consequence of that, I think, that his authorship ceased. (Renewed laughter.) There are here, I know, a large number of gentlemen who are interested with me in the little company to which I belong, though not to the same extent as I am, because I flatter myself that I am the largest shareholder. I have not sold any shares, nor do I intend to. To those gentlemen I may say this, that things are going on as happily as we should wish. During the last fortnight we have received a cablegram of the most encouraging character. I am not here, however, to boast anything in particular, but I will say that I am satisfied that the work in which I took part in Western Australia will be for the benefit of all of us. I will not mention any particular property; but I will say that, as far as my information goes, including the cablegram I received yesterday, I am satisfied that up to the present we have not made any mistake, nor have we expended any large sum of money. I am exceedingly obliged to you for the honour you have done me, and I can assure you this will be a red letter day for me. I am delighted to be among you, and to have had my name so well received. I shall endeavour in the future, as I have done in the past, to bring about a successful issue for all the properties in which we are interested. (Cheers.)

The CHAIRMAN then proposed the toast of "The Visitors," associated with the names of Mr. Henniker-Heaton, M.P., Mr. Johnson, Dr. Lindsey, and Mr. Zebina Lane, each of which gentlemen responded in a few words, speaking particularly of the bright outlook in connection with Western Australia as a mining country, and to the services rendered by Mr. Pritchard-Morgan in that country.

Mr. PRITCHARD-MORGAN gave the health of the Chairman, which was enthusiastically received.

A musical programme followed, and the company broke up about midnight.

Mr. George T. Broadbridge discharged the secretarial duties, and the pleasant and successful manner in which everything passed off reflected the greatest credit upon his management.

SEPARATION OF SILVER FROM GOLD BY VOLATILISATION.

By DR. JOSEPH W. RICHARDS, of the Lehigh University:

(From the *Journal of the Franklin Institute*.)

IN making the quantitative blowpipe assay for gold and silver, it is usual to treat 100 milligrams of ore at a single fusion, yielding buttons which are too small to be weighed accurately, but whose weight must be found by measuring carefully their horizontal diameters.

As determined by Plattner (and often verified in the writer's experience), silver buttons weigh 0.8346 of the weight of spheres of silver of the same diameter as measured, and gold buttons 0.7506 of the weight of gold spheres. The buttons obtained usually weigh 0.5 to 1.5 milligrams, and the separation of the silver from the gold in buttons so small is a matter of considerable difficulty. Plattner remarks that no satisfactory method of separation in the dry way is known, and recommends the parting by nitric acid. Working, however, with buttons smaller than pin heads, it is extremely difficult to boil two or three times with nitric acid, to wash until the silver salt is all removed, and then to gather and melt down the gold, without losing a considerable proportion of the gold in three or four directions.

Knowing that, on long heating, silver gives a coating of oxide on charcoal, and that gold does not, I made experiments to determine whether silver could be thus separated from gold, and have found the method practicable. On heating to a bright yellow heat (not to whiteness) upon charcoal an alloy of gold and silver, before a sharp-pointed oxidising flame, the silver volatilises easily and steadily until there is less than 5 per cent. of silver remaining in the gold. I estimate this volatilisation to take place little above the melting point of copper (say) at 1100-1200° C. To remove the remainder of the silver, the heat is raised nearly to whiteness, or to about the melting point of steel. (1500° C.) When the silver is entirely eliminated, the gold, at this temperature, begins to volatilise also; in fact, a trace of gold will be carried off with the last of the silver, and if the ash of the charcoal be white it will show a faint crimson coating close to the assay. When this coating is heavy enough to be seen without the use of a lens, the silver has been completely volatilised, and the remaining button is pure gold. The amount of gold necessary to give this coating is too small to be determined by weighing or measuring.

Having explained the principle made use of, I will give the further details of conducting the operation. The charcoal should be dense, so as not to burn away too quickly. Too light a charcoal will not stand the five or ten minutes' application of the oxidising flame without burning through the piece. It should also leave a white ash under the oxidising flame, so as to furnish a background on which to see the crimson gold coating which determines the end of the operation. I have found the dense, hard charcoal made by Johnson and Co., of New York, to answer these requirements admirably. It is well, also, to work with a porcelain saucer, or large sheet of clean paper, under the flame, to catch the button in case it should be blown from the charcoal.

In order to perform this separation without excessive exertion, I would recommend that a gas flame not over 2 centimetres high be used, that the tip of the blowpipe be advanced at least half-way through the flame, and inclined somewhat sharply downwards, at an angle of about 45°. By observing these simple directions, a very sharp pointed needle-like oxidising flame will be produced, about 1 centimetre in length to the blue tip, which I have found the best for the purpose in view. To produce this the blowing need not be strong, but it should be kept up steadily. The button, in a shallow cavity near the end of the stick of charcoal, is now brought directly in front of the point of flame, at about 1 to 2 millimetres from the visible blue tip. Its position, of course, is regulated by the temperature observed. The button should not, at this stage, be heated to whiteness, else the silver will boil and cause a loss by sputtering. The charcoal is held inclined towards the flame at an angle of about 30°, so that the flame descends almost vertically upon the button, and thus decreases the liability of its displacement by the force of the blast.

It will be found practicable to continue a blowing for about three minutes without discomfort, at the end of which time the operator may stop to observe the colour of the button. Supposing the alloy, on starting, to have been white, it will usually become pale yellow in from three to six minutes. When the alloy exhibits a brass-yellow colour, the heat should be raised, and the next blowing continued for

not over two minutes. At the end of this time the alloy will usually exhibit nearly the pure gold colour, but no gold coating, or, at most, only a trace of it will be seen on the charcoal. After this, the heat should be raised to nearly whiteness, and then continued for not over one minute at a time. If a faint gold coating appears, further heating for one minute will usually develop a distinct crimson coating visible without the lens, and the alloy will show the pure gold colour. It is then taken out, cupelled, and measured.

If the amount of gold present be very small, it is difficult to continue volatilising silver after the button gets smaller than 1 millimetre in diameter. The difficulty is caused by the ash of the charcoal, which, fusing to a slag, envelopes the button. To continue the removal of the silver, should the button arrive at this size without showing the gold colour, the operator cupels, and measures a pure gold button of about the same size, and adds it to the button being treated. The enlarged button is now worked down to pure gold, as before, removed, cupelled, and measured. The weight of gold obtained is diminished by the amount added, the difference giving that in the ore.

If the heating to incipient whiteness be continued two or three minutes after the visible gold coating is obtained, a very pretty gold coating of bright, peach blossom colour is obtained, and a sensible amount of gold is lost by volatilisation. A pure gold button, 1 millimetre in diameter, weighing 7.58 milligrams, lost 0.03 milligrams (0.4 per cent.) each minute that it was heated to whiteness, and in five minutes gave a beautiful crimson coating. A silver button of similar size lost 18 per cent. of its weight each minute, at only a bright yellow heat. I estimate the point at which gold begins to volatilise as about the melting point of soft steel. (1500° C.) It is certainly considerably below the melting point of platinum. (1775° C.)

In conclusion, I wish to say that I have tested this method of separation in many different ways, with large and small buttons and upon alloys rich and poor in gold, and have found the separation to be absolute when the conditions above described are properly observed. I have repeatedly alloyed a gold button with different amounts of silver, and then driven off the silver; the button, after two or three of such separations, remaining of exactly the same size and weight as at the start. In proposing this method of separation, I do not wish to disguise the fact that, to ensure success, it demands a steady hand and an experienced operator, and the art of blow-piping sufficiently to make gold and silver assays can, in a short time, master this method of separating the gold and silver.

[In the discussion of the above paper, it was suggested that the method might be practicable in the ordinary assay of gold and silver, as at assay offices, if an electrically heated furnace could be devised, in which the buttons could be placed on suitable supports, and kept at the proper temperature to volatilise silver with a current of air passing over them. The movement to the hottest part of the furnace would suffice to remove the last traces of silver, just as the last traces of lead are removed in cupellation in an ordinary muffle. The process of removing the silver would then resemble cupellation in its general outlines, except that the temperature would be about 300° to 600° higher.]

SOME NOTES ON THE MOUNT LYELL MINE, TASMANIA.

By SYDNEY FAUNES.

THE Mount Lyell Mine is situated about 1200 feet above the sea level, on the northern slope of the Great Lyell range, not far from the centre of the Montagu country, West Coast of Tasmania. It is 45 miles south of the celebrated Mount Bischoff Tin Mine. The nearest point of supply is Strahan, situated on McQuarrie Harbour, to which a railway is rapidly being constructed, a distance of about 30 miles.

Natural Features and Climate.—This part of Tasmania is exceedingly mountainous, and covered with an impenetrable scrub, or a boggy layer of peat. Fortunately, the valley of the Queen River affords a comparatively easy route to the railway. The climate, although very wet, is healthy, frost being very rare. The rainfall for the last two years was over 80 inches.

History of the Mine.—This property first attracted attention about 1880, when it was taken up and worked for alluvial gold. After the alluvial ground had been exhausted, a fresh company was formed, about 1883, to work the auriferous gossan. This new company erected a 10 head battery, but the gossan, which was rich enough to have paid under ordinary conditions, failed to pay owing probably to the presence of a large percentage of fine float gold which was lost, and also to the presence of some minerals which interfered with the amalgamation. After varying success, it was finally abandoned as unprofitable. It was only when examined by Mr. Schlapp, the metallurgist of the Broken Hill Mine, New South Wales, that the true nature of this deposit was recognised, and it was on his advice that Dr. Peters, jun., examined the mine in 1893. Previous to the discovery of Mount Lyell, no mine of a similar nature had been worked in Australia, and anything like the smelting of low grade pyrites had never been attempted.

The Ore Deposit.—This may be aptly described as a huge lenticular body of iron pyrites with varying proportions of copper pyrites intermixed with iron pyrites. It is remarkable for its width. At one point, near the centre of the deposit, the subsoil has been removed by previous alluvial workings, and the deposit measures 300 feet in width, and contains no gangue larger than a walnut. In a southerly direction from this point the deposit becomes covered with rock, and is soon buried beneath 100 feet of the solid formation. In a northerly direction the ore body is broader than the 300 feet mentioned, and gradually merges into the country rock. Some very rich silver copper ore has been raised from a vein occurring by the side of and partly underneath the vast mass of hematite which is found on the foot-wall of the deposit.

The quantity of this rich ore which has been raised and sold since the formation of the company in 1893 is 849 tons 16 cwts., giving the wonderful return of 858,915 ounces of silver and 196 tons 12 cwts. of copper. The net amount received for this was £106,325 10s. 7d.

"The gossan cupping of the deposit, locally known as the Iron Blow," is a purplish iron mass, and makes a prominent object in the landscape. This ironstone is auriferous, the silver and copper having been leached out, and has probably given rise to the rich vein worked in the footwall. Another feature of note is the existence of a massive body of barytic hematite, which forms a triangular wedge in the footwall side of the vein. This iron is most probably a secondary deposit derived from the main body. The length, so far as it is actually traced on the surface, is 950 feet, the ore being proved to a depth of over 250 feet. Assuming the average width of the ore body to be only 2.0 instead of 300 feet, and taking the moderate estimate of 280 lbs. per cubic foot for the ore *in situ*, we have a total amount of 4,600,000 tons above the present lowest workings. It is now proposed to drive a tunnel from the Queen Valley,

* A paper read before the Institution of Mining and Metallurgy.

which will cut the ore body at 300 feet below the deepest point explored, and it is evident that vast quantities of additional ore will thereby be developed.

Ores and Minerals.—The main body consists of low grade pyrites, which makes up about 90 per cent. of the deposit, and has the following average composition:—

Bisulphide of iron, FeS_2	83 per cent.
Chalcopyrite, CuFeS_2	14 "
Barium sulphate, BaSO_4	2 "
Silica	1 "
	100

There are traces of tin and lead, and when fahlore is present some traces of antimony and arsenic have been met with.

The gossan also forms an important commercial feature of the mine, and has an average composition of—

Barium sulphate	55 per cent.
Iron oxides	35 "
Silica	10 "
	100

Argentiferous iron pyrites of varying composition forms the most abundant variety, and is of great value in smelting operations, being nearly free from copper, and simply enriching the matte by the gold and silver it contains. *Argentiferous bornite*, which is very rare, occurs at the Red Mountains, Colorado, U.S.A., where it is associated with stromeyerite and fahlerz. Native copper occurs in small detached specimens. Near Mount Lyell some large aborescent masses have been found, weighing several pounds. These are generally embedded in clay or marl, and sometime attached to limonite. Argentine (silver alance). Some exceedingly rich ore has been taken out at times, reaching to 50 per cent. of silver, or 16,000 ounces per ton. Fahlerz of varying composition, containing copper, silver, and sulphur, with traces of antimony. The vein worked near the footwall has yielded ore of over 600 ounces of silver to the ton. Chalcopyrite occurs in varying quantities throughout the deposit.

Mine Workings.

The present workings consist of five tunnels, with drives and crosscuts:—

No. 1 Tunnel.—This is driven under the gossan cupping, at 65 feet, in a body of massive pyrites, which average 9 per cent. of copper, 3 dwts. of gold, and 3 to 4 ounces of silver per ton. No. 2 tunnel is only 36 feet below No. 1, and passes through a mass of red ironstone for a distance of 146 feet. It may prove of value in the future as an iron ore. The last part of this tunnel cuts the lode proper, which here averages 8 per cent. of copper. No. 3 tunnel, 60 feet below No. 2, was driven through the country rock for 128 feet before striking the lode, and then follows the pyrites for 330 feet. Total length 458 feet. A south drive, begun at the point where the tunnel cuts the footwall of the lode, has proved the extension of the ore body in a southerly direction, and here the ore fully maintains the average contents of gold and silver. In the north drive, to further test the value of the pyrites, two crosscuts, one at 57 feet and the other at 159 feet, were driven 27 and 31 feet respectively, the result being very satisfactory. A winze has also been sunk between Nos. 3 and 4 tunnels, which proves the existence of exceptionally good copper ore between the tunnels. The average of the ore body here is slightly under 7 per cent. of copper. No. 4 tunnel, 100 feet below No. 3, penetrates the country rock for 343 feet before cutting the lode. A north drive has been extended at this point for 209 feet, following the pyrites wall; for the whole distance good ore has been proved to exist along the wall, and whenever the rock has been weathered a thin vein of oxidised material, exceptionally rich in gold and silver, occurs. A bulk of 7 tons from this vein gave 11 ounces 4 dwts. of gold, 34 ounces of silver, and 8½ per cent. of copper per ton. No. 5 tunnel has been driven a total length of 1108 feet. The rock here is of a particularly hard and dense nature. The pyrites body was cut at 1100 feet. The assay value of the ore here was, gold 1 dwt., silver 3 ounces, copper, traces.

Proposed Method of Working the Mine.—The open cut system will ultimately be adopted, and it will be seen by reference to the sketch that after stripping the deposit from its overburden, a series of faces will gradually be opened out, which will then be connected with the tunnel, and thus communicate with the smelter site in the Queen Valley. All the mining will be done by rock drills.

Treatment of the Ore.

The metallurgical plant now nearly completed is arranged in two departments; one in which the ore is smelted for a copper matte, and the other in which the matte containing the precious metals will be converted into pig copper by Bessemerisation.

The first operation will be performed in water-jacketed blast furnaces, and the wear and tear reduced to a minimum by jacketing every spout or tap-hole that is likely to wear out quickly. These furnaces will be run on the principle of a continuous discharge with trapped blast, and with the use of an external movable forehearth for the separation of matte and slag. The furnaces measure 168 x 40 inches inside the jacket at the plumb of the tuyeres, and 183 x 58 inches at the throat. They are provided with a double tier of large steel water jackets, resting on bottom plates supported by a number of screw jacks, and the jackets are surmounted by a superstructure of brickwork carried on the usual corner columns. A downcast flue takes the fumes and gases to the usual flue against the retaining wall of the bin bench to the top of the furnace, which is 20 feet above the floor, and is surmounted by brickwork, provided with sliding doors, and capped by a hood and smoke-stack with dampers.

There are 32 3-inch tuyeres. The hot blast stores consist of a series of hanging V-tubes of cast iron, suspended in a brick heating chamber, and fired from ordinary fire boxes. The blast will be supplied by two No. 7 Roots' blowers, with engines attached. Power is furnished by two Babcock and Wilcox boilers, of 250 horse-power. A spacious brick flue 250 feet long conducts the furnace fumes and gases to the main chimney, which is 244 feet above the slag dump.

About 6 or 7 tons of 5 per cent. ore (containing also 3 dwts. of gold and 3 ounces of silver) will be concentrated into 1 ton of about 33 per cent. copper matte. This is estimated to cost about 15s. per ton.

Bessemerising the Matte.—This operation will be conducted on the Manhe's system in furnaces of the Bessemer converter pattern, similar to those in use at the Parrot Mine, at Butte, U.S.A. In this process the matte is subjected to two successive blowing operations of 30 minutes each, by which the matte containing 33 per cent. of ore will be brought up to black copper of about 96 per cent., which will contain on an average about 60 to 70 dwts. of gold and 100 ounces of silver. The process of roasting is thus dispensed with, the sulphur and iron in the matte acting as fuel.

It is not proposed at present to separate the gold and silver from the copper at the mine, but to ship and sell the pig copper to refiners, either in America or England (where electrolysis has been brought to a state of perfection).

The estimated cost of treatment given by various companies averaged about £4 per ton of copper.

Table of Costs.—No exact estimate can yet be made, but the

following table has been compiled, and will most probably be found rather over than under the actual cost:—

	£ s. d.
Mining, crushing, & transporting to furnaces	0 5 0
Smelting and flux	0 13 0
Bessemerising the matte	0 5 6
Separating and refining metals	0 4 0
Freight and selling metals	0 5 9
Extras	0 1 3
	1 14 6

Total value of average ore per ton	3 6 5
Total cost of ore per ton	1 14 6

Nett profit per ton of ore

1 11 11

The gossan, and most of the silver ore, will not cost anything like the above, and as there is no copper to speak of in the gossan the gold and silver will enrich the matte at, practically speaking, no extra weight, so that the cost of treating these ores will be:—

	£ s. d.
Mining	0 3 0
Smelting and flux	0 15 0
Extras	0 1 3
	0 19 3

Flux and other Supplies.—The company are fortunate in holding a good limestone section, which will yield ample material for fluxing purposes, and, in addition to this, in the underlay of No. 4 exists a siliceous rock which can be used as a flux if required.

There is an unlimited amount of good refractory clay near the mine which will answer admirably for the linings of the converters. A practically inexhaustible supply of good timber is ready to hand, both on the company's section and in Queen Valley. This consists mainly of gum, but King William pine, celery top, and myrtle, is available, and can be used where more serviceable.

Mr. Claudet's Assays of various Parcels of Argentiferous Copper Ore from the Mount Lyell Mine.

Copper (wet assay).	Silver (per ton of 2,240lb.)		Gold (per ton of 2,240lb.)	
	Oz. dwts.	gr.	Dwt.	gr.
Per cent.				
24.91	1,061	13	6	12
25.02	1,048	12	5	—
26.20	1,432	8	9	—
28.40	1,011	—	6	12
26.40	3,804	—	9	—
28.62	1,006	15	3	—
26.48	1,471	—	3	—
28.40	1,087	16	3	—
28.16	1,074	8	3	—
28.32	1,079	6	3	—
26.50	952	4	traces	—
26.45	951	4	3	—
24.40	1,166	17	traces	—
23.80	1,035	10	traces	—
27.75	618	14	—	—
27.65	617	8	—	—
27.90	646	16	—	—
23.70	1,045	6	—	—
23.95	1,045	6	—	—
27.05	620	13	—	—
27.00	617	8	—	—
26.35	839	10	—	—
24.75	1,388	6	—	—
24.80	1,104	2	—	—

The company's property comprises 325 acres, held under lease from the Crown, at the mine, and a smelting site of 45 acres, also the exclusive right to all the timber over 2500 acres in the Queen Valley.

In conclusion, when the extraordinary size and facilities for mining this remarkable deposit are considered, together with the fact that pyritic smelting is practically a new thing in Australia, it must be admitted that the future operations of this company at the mine, as well as the result of the smelting, will be watched with the greatest interest.

Everything, both connected with the mine and the smelting plant, is being carried out by experienced engineers and metallurgists, under the advice of Dr. Peters, and the smelting plant is expected to be in full operation during the latter part of this year.

The author is indebted to Dr. Peters and Mr. Robert Sticht for some of the particulars contained in this paper, and to Messrs. Fraser and Chalmers for permission to reproduce a plan of the furnaces and general arrangements of the Mount Lyell smelting plant.

DIARY.

Saturday, June 27.

Consolidated Gold Mines of Western Australia, Edinburgh, 12. New African, Cannon-street Hotel, 12.30.

Monday, June 29.

Blue Spur and Gabriel's Gully, Winchester House, 12. Kathleen Crown, Winchester House, 12.

New Gordon Diamond, Winchester House, 12.

Silati, Winchester House, 12.

Wemmer, Johannesburg.

Tuesday, June 30.

Balaghat Mysore, Cannon-street Hotel, 11.30.

De Lamar, Winchester House, 12.

West K'ty, St. Agnes, Cornwall, 12.

Tin Ticketing, Tabbo's Hotel, Redruth, 1.

United Kingdom and Foreign Investment, Winchester Ho., 2.

Namaqua Copper, Cannon-street Hotel, 2.30.

Treasury, Johannesburg.

Wednesday, July 1.

Sutherland Reef, Winchester House, 12.

Octagon Explorers, Winchester House, 12.30.

Loma, Winchester House, 1.

Delta Syndicate, Winchester House, 2.

"90-Mile" Proprietary, Winchester House, 2.30.

Thursday, July 2.

Mequital del Oro, Winchester House, 12.

Tolima, Winchester House, 12.30.

Colonial Bank, Bishopsgate-street Within, 2.

Friday, July 3.

Hannan's Reward, Winchester House, 12.

Hannan's Consolidated, Winchester House, 12.

Hauraki, Winchester House, 12.

Geologists' Association, University College, 8.

</

is the opposition to its introduction. Fallacies and swindles are readily—nay, even eagerly—pressed forward. Great and new truths rarely receive appreciation under a period of at least a quarter of a century. It is, unfortunately, often much longer, but even that is far beyond the duration of the patent anywhere except in Mexico.

J. H. SELWYN, Admiral.

186, Gloucester-terrace, Hyde Park, London.

REVIEWS.

The Mining Manual.—By Walter R. Skinner, 26, Nicholas-lane, Lombard-street, E.C. The late appearance of Mr. Walter Skinner's well-known "Mining Manual" is fully explained and justified by the extraordinary magnitude of the task which the compiler has had to discharge. The editor has set himself out, in his own phrase, "to keep pace with the course of events," and, as everyone who is at all likely to take up the Manual knows, events have marched rapidly during the past 12 months. There is, indeed, absolutely no precedent in City history for the extraordinary period of company creation through which we have just passed, and the task of putting into permanent form a host of particulars respecting the objects, location, capital, and directorate of each separate enterprise, is obviously a task of a very heavy character. During the year covered by the Manual no fewer than 1585 new companies made their appearance—a number which is not approached even by the 961 concerns which were launched during the year preceding, and which almost immeasurably exceeds the number of new enterprises brought into being during the time of the great South African boom.

The immense preponderance of the year in question over all others is revealed in the fact that Mr. Skinner has found it necessary to add no fewer than 600 pages to the book, which has now attained dimensions large enough to excite apprehensions as to table room. The gigantic character of the work entailed in submitting all this matter to the different companies interested is at once apparent, and would be sufficient to discourage anybody in whom the instinct of compilation was not strongly marked. Like the editions which have gone before, the Manual for 1896 is thoroughly up to date, and the leading particulars of information are frequently given in cases where the company has not got sufficiently into working order to enable its management to transact business. As the editor points out in a pithy little preface, the chief features characterising the mining revival of 1895—the great position attained in producing capacity by the Witwatersrand mines of the Transvaal; the commencement of settlement and exploration in the territories of the Chartered British South Africa Company, now known as Rhodesia, and the developments commenced in the colony of Western Australia—have progressed and intensified during the present year. The world's production of gold, moreover—more than 10,000,000 ounces—proved the largest within recent years, while the enormous works of development progressing in Australia may confidently be expected to produce a permanent effect upon the output figures of the future. From these particulars it will be gathered that the general impression created by this exceedingly useful Manual is one of surprise at the gigantic progress which has been made by the mining industry on its speculative and investing side since the commencement of the current revival. If in the immediate future the movement increase, in a progressive ratio, it is almost appalling to reflect upon the labour which will fall upon Mr. Skinner's staff during next year, and in a lesser degree upon the dimensions of the volume that will issue from the Press in 1897. Although, naturally, not undertaken from philanthropic objects, the work of compiling and bringing out the Manual is a very useful one to the City public at large.

Chemistry at a Glance. Herbert B. Tuttle. No. 1.—Oxides. (New York, 1896.)

We are at a loss to know what good purpose this little pamphlet is supposed to serve. It is a list of a number of chemical compounds, and of some of their properties, accompanied by their formulae, given in graphic notation. This is the notation that Dr. Frankland tried to popularise years ago, but failed, because the notation was found too cumbersome for ordinary use. Where Dr. Frankland failed, Mr. Tuttle is not likely to succeed, for the former's little work—"Lecture Notes for Chemical Students"—is an admirable little book as this is the reverse. Its arrangement may be gathered from the fact that a select few of the ethers—not all by any means—are included among the list of oxides, and that potassic peroxide is classed as an oxide, whilst hydroxyl is classed as an oxate, whatever that may be, for the author does not make it clear. Indeed, Mr. Tuttle's strength does not lie in definitions. The following may serve as a sample of his powers in this respect:—"A substance is inflammable when it is endowed with the tendency to inflame." It is, perhaps, to this weakness of his that we owe the title of the book. Fifty-nine pages cannot be called a glance, any more than their contents can be called chemistry. There is only one statement which seems to agree with our views. We find a statement that a table showing an absolute scale of temperature is included "worth the price of the book"; we don't think very much of this scale, which any ordinary student would construct in five minutes, but it clearly follows from the author's valuation that, if this table is worth the whole price of the book, then the rest of it is worth nothing. And this is precisely our own estimate of its value.

Mr. Magnus. (London: T. Fisher Unwin, Paternoster-square, E.C.)

This novel is published anonymously, and we must hasten to commend the author for his discretion. If he be ambitious to achieve any distinction in this branch of literature, we are afraid it will be labour in vain, for Nature never intended him to be a novelist. *Mr. Magnus* is conspicuous in lacking every quality essential for the production of a readable novel, and we cannot conceive anyone patiently reading it through from the beginning to the end. Not that the author is deficient in style. He has a good command of language, and displays some ability in description, but he cannot interest us; cannot move us; cannot command our sympathy. His efforts at pathos are painful, and his dialogue is as wooden and unnatural as it can possibly be. Nellie Wolston is the heroine. She is, as usual, a pretty, vivacious creature, noted for her daring spirit and her skill in riding. One day, however, she meets with an accident, and is rescued by Philip Winter. The latter falls in love with her and she with him. Philip is the bosom friend of her brother Ray. The latter, however—why, the author does not tell us—leaves home for South Africa and fills a subordinate position in a diamond mine owned by a Mr. Magnus. Philip goes out with him to look after him, as Ray is hardly capable of looking after himself. This takes place before the story opens. Letters are regularly received from these youths, but at last none come, and causes grave anxiety at home. Then one is received from Philip, who hints that Ray is in trouble, though he omits to give the nature of it. Where-

upon, Nellie determines to go to South Africa alone to look after her brother, and at the same time to be near her lover Philip. Her parents consent, and away she goes, and on the journey makes the acquaintance of Mr. and Mrs. Clayton, who afterwards render her great services. She quickly learns that Ray has been arrested for being in possession of diamonds, and is in danger of being sent into penal servitude. But Ray is innocent, and is the victim of a conspiracy to ruin him. Now, here was a fine opportunity to move us, but the attempt to depict Nellie's grief is utterly feeble, the author being absolutely incapable of conceiving and describing it. Everyone knows that Ray is innocent, but as in Camberton it is necessary for the culprit to prove it, and as the court always has the benefit of the doubt, and as the owners of the mine really control justice, his prospects are of the blackest. But incidents favourable to him happen. Without any warning we learn that the charge has been withdrawn; a storm damages the mine; it collapses, and Mr. Magnus' pernicious influence wanes. That is the plot, not a powerful one, nor original, but not rendered interesting in the hands of the author.

Gregory's Guide to Westralia's Gold.

The number of Mr. George Gregory's publications are becoming legion, and this latest, considering the importance of the gold mining industry of Western Australia, and the intense interest which it has aroused, is not the least useful. The information which is contained in its pages is not original, and although we have not employed the same phraseology, still the information has appeared from time to time in our columns. But it is none the less useful to the investor, inasmuch as it is published in a handy volume, which makes it more easy for reference. The first portion of the volume is taken up with a description and history of the country, together with its geological features, whilst a great part of it is composed of quotations from the important report of Herr Schmeisser, from the extracts which appeared some weeks ago in the *Times*. However, we ourselves are reproducing the whole of this report verbatim, which, of course, will give our readers more fully the opinions of this eminent expert. These features are succeeded by a list of the principal properties situated in the leading districts of the colony, with the dates of their registrations. The vital question of railways and water are then discussed, followed by other tables giving the world's gold production, Australian gold production, the annual production and value of West Australian gold from the years 1886 to 1895, and the gold yield of the colony from 1891 to 1895. Then a list of batteries is given at the mines on the Yalgoo, Murchison, and Peat Hill gold fields, followed by a table of the exploration companies. The remainder of the book is taken up with giving the essential features of the leading companies.

Kindell's African Market Manual. 1896. (London: Mathewson's.)

Another mining manual—which confines itself to the South African Market, and which is well known and highly esteemed in Stock Exchange circles—is the above, which is principally recommended by its neatness, its accuracy, and the accompaniment of an excellent map of the South African Republic. Like other publications of the same class, this manual is rather beyond the usual size upon this occasion, and will be likely to find increased favour amongst the public to whom it is addressed.

Annuaire Français—Marché des Mines d'Or. (C. Lamy, 124, Boulevard de la Chapelle, Paris.)

This book, which is drawn up in the style of our Mining Manual, is, of course, written principally for French investors. It is a production which is greatly needed in that country, which of late has taken such an absorbing interest in the gold mining industry, especially in that of South Africa and Western Australia. It is certainly drawn up with much care and ability, and should speedily come into great favour with the investing community. It deals only with South African companies. Later on, we understand, a volume will be published dealing with West Australian concerns.

ANCIENT MINING.*

WITH ESPECIAL REFERENCE TO THAT CARRIED ON IN GREAT BRITAIN.

By A. COOPER KEY (Student).

(Concluded from page 734.)

THE working of copper mines in North Wales, in the island of Anglesea, has been traced to a very remote era. At Bryd-Amlwch, near Holyhead, Mr. Thomas Evans discovered three cakes of copper, evidently of Roman origin. Regarding silver, Cicero, writing about B.C. 106, says "it is well known that not a single grain of silver could be found in the whole island." This is contradicted by other authors; the sentence may, perhaps, mean that it was not in sufficient quantity to be, as Tacitus thought, "the prize of victory." We are told by Hutton of an enormous heap which existed at Birmingham "since the Roman time." Yarranton relates how at Worcester he found the hearth of a Roman furnace; and also a large heap of débris, from which he took away many tons, and, the ore having been imperfectly smelted in the Roman times, was able to obtain therefrom a considerable amount of iron. "The great heaps of cinders made from ironstone was the waste thrown out of the foot blasts, the Romans having no works to go by water, but all by the foot blast."

At various places on the Mendip Hills, in Somersetshire, particularly in the parishes of Rowberry, Shifnal, East Harptree, and Priddy, there are evidences of Roman lead workings, both in the way of mines, and in the immense slag or cinder heaps. Attempts have been made (e.g., at St. Catherine's, near Priddy), to extract the lead, amounting to about 20 per cent., which, owing to the imperfect smelting operations of the ancients, remains in the scoria, but these efforts have never been financially successful. In some cases, indeed, they have been the cause of the bankruptcy of the adventurers. The certain rent which was at first charged for about 20 acres of debris ground was £1000 per annum, and the royalty rent reserved 1-10th of the average selling price, after deducting certain charges. These have respectively been reduced to about £80 and 1-30th of such price, by easy stages under different leases.

In Montgomeryshire, near Machynlleth, a Roman copper shaft was discovered about the middle of the present century. It contained a small Roman pick and some spears. The pick is 9 inches, from point to point, and is in shape like a common pickaxe. A fine lode of copper was discovered in driving at experimental level, and there were two strong lodes in the shaft, which is 50 feet deep, driven through the solid rock. The Romans had an important station at Buxton, and in the words

* A paper read before the first Students' Meeting of the Institute of Mining and Metallurgy.

of Rochester, Uttoxeter, and Chesterfield, we have evidences of Roman occupation, signified by the root castra. It is certain that Derbyshire was extensively worked for lead, and the produce of the mines was jealously guarded for Roman use. In the British Museum are to be seen pigs of lead with Roman stamps, those of Hadrian and of Domitian. They were thus impressed with the Imperial mark, to prevent them being dealt with except by the officers of the Government. Mr. Thomas Wright, in 1861, visited the Forest of Dean. He found great pits, out of which the ironstone had been dug, and in which Roman coins had, from time to time, been discovered. He traced cinders covering the earth in many parts of this district. On the banks of the Wye below Monmouth, considerable quantities of cinders are also found. It is supposed that Bath was the seat of their foundries.

At Bishop's Castle, Shropshire, in 1767, was found a block of lead stamped with the Emperor Hadrian's name, about 1 foot beneath the surface. Perhaps more interesting than these relics, however, is the tesselated pavement, 300 feet long, the flooring of a Roman villa found at Pitney, near Longport, Somersetshire. "In a small room is depicted a young man striking blows with great force and fury against the hydra (water monster), which is the greatest enemy to mining. There are also in another room figures of servants with rakes, forks, pincers, long iron rods (straight and crooked), canisters and pots, all of which are used in the smelting process. From one of the smelting pots coin appears to be dropping." Roman coins and pottery have been found in large accumulations of slag at King's Cliffe, Oundle, Laxton, Rockingham, Kettering, and Irchester, in the county of Northampton.

Sussex contributes its quota of evidence concerning Roman work. At Maresfield, among other places, coins of Nero, Vespasian, and Tetricus, together with fragments of pottery, have been unearthed. It is thought from the discovery of skeletons in the cinders forming the waste from the iron bloomeries, that the Kelts worked ironstone in the county before the Romans; there is, moreover, literary evidence to support the theory.

Subsequent Mining Operations in Britain.—The Saxons settled in Cornwall in the year 947, but no evidence exists as to their mining. There is, further, no mention of mines in "Domesday Book." The Stannary Courts appear to have been established by Athelstone in 950. The Jews, who had worked in Cornwall for some centuries, were expelled the country by Edward I., about the year 1201, and from this date Cornish mining was neglected for a longer period. A grant, made to the Abbey of Peterborough in 852 A.D., proves the acquaintance of the Saxons with coal. Turning to Derbyshire, we read that in the year 1086 Wirksworth was a place of industrial prosperity, its population of about 1000 being chiefly engaged in lead mining and smelting.

The Moothall of that town contains the miners' standard dish, a measure of 14 pints, which was made in the reign of Henry VIII., who ordered it to "remayne in the Moothall at Wirksworth, hangyng by a cheyne, so as the merchents and mounys may have resort to the same at all times to make the true measure after the same." Queen Elizabeth paid much attention to British mines, and she caused German miners to be employed in this country, who improved the methods of working. In 1239 Newcastle obtained a Charter for the license of digging coals. The coal worked in this district was called "sea coal." In 1306 the use of this kind of coal was prohibited in London on account of its supposed tendency to corrupt the air.

In the 16th century best coals were 4s. 1d. per chaldron in London, and about 2s. 6d. at Newcastle. The highest price ever obtained for coal was the almost incredible sum of £6 per chaldron, which was charged in London in April, 1799. At the beginning of the 17th century the average annual export from Newcastle was 180,000 chaldrons, and during the 18th century 650,000 chaldrons per annum. The Cornish miners held a strong superstition that in the withdrawing of Noah's flood to the sea it took its course from east to west, violently breaking up and carrying with it earth, trees, rocks, and, in fact, anything which lay loosely. They also held that tin would grow again if the mines were allowed to remain idle for 30 or 40 years. (This idea seems to have also been believed in by the Phoenician and Roman miners in Spain.) It is curious to find this belief as to the growth of tin in the mines; it might, perhaps, have some foundation, in fact, in the case of stream tin washed down from the hills adjacent. The workmen in mediæval times received from £4 to £8 per annum; when paid by the day their wages were about 8d. It must, of course, be remembered that these sums would, in dealing capacity, be equal to considerably larger amounts at the present time. The author trusts that he has not passed over anything of importance, and hopes his attention may be directed to any omissions of details which may have escaped his notice.

COMPRESSED AIR, HAULING, AND PUMPING APPLIANCES.—The attention of the Royal Cornwall Polytechnic Society having been directed to the necessity of greater economy in the consumption of coals in the working of mining machinery, they welcome any practical communication or exhibit on the subject, or as tending to economy in the working of mines. Medals, supplemented by substantial money prizes, where the judges consider there is sufficiently high merit, are offered for papers on the following subjects:—The most economical method of compressing air for working rock drills; on the best shaft to be sunk for the permanent working of Cornish mine, at depths of 200, 400, and 600 fathoms respectively, and where the underlay is not less than 3 feet base to 6 feet perpendicular; for the best method of getting tin-stuff or rubbish from the bottom of a shaft to the surface without a second handling of the same (special attention to be paid to provision for lengthening the skiproad with the sinking of the shaft); and for accurately drawn cross sections of Cornish mining districts, from the competitors' personal observations, duly certified. Medals are also offered for the best appliance by which water can be raised from the sumps of shafts, or from sump winzes, other than by the use of bucket lifts, applicable to Cornish mines; and for improved stamping machinery. In connection with the same section (in which all papers have to be sent to the secretary three weeks before the exhibition commences), premiums will be awarded for the original assays giving the most exact account of the phenomena of mineral veins in any mine or district, with their dip, direction, variation in productiveness, slides, beavers, &c.; for improved machines for, or modes of, dressing ores; on winding appliances for Cornish mines, including different classes of engines; and for the best appliances to prevent overwinding, or to minimise injury resulting from it.

THE BLUE SPUR AND GABRIEL'S GULLY CONSOLIDATED GOLD COMPANY (LIMITED).

The books of the company will be closed from the 24th to 30th June in connection with the preparation of the dividend warrants for the ordinary and preference shares.

—The London agents of the LANGLAAT ESTATE AND GOLD MINING COMPANY (LIMITED) and the ROBINSON SOUTH AFRICAN BANKING COMPANY (LIMITED) have received cable advice of the declaration of a dividend of 15 per cent. (equivalent to 3s. per share) for the half-year ending June 30. The reduction in the dividend is due to the disturbances in the Transvaal and consequent short supply of labour during the past six months. The labour supply is, however, now more plentiful, and the mine will soon be again in full working order.

T
incre
popu
m n
\$350
norm
We
distin
furnis
coal

Bitum
Pig i
Auth
Silve
Build
Gold
Copp
Potra
Natu
Lead
Clay
Zinc
C-me
Silt
Mine
Phos
Lime
Mine
Quick
Bora
Soap
Gyps
Pyrit
Asph
Preci
Th
spea
in th
chanc
porar
Thus,
yet i
our s
count
worth
an ag
Cent
soaps
quick
tum,
graph
stone
in the
first a
that
keep
forest
of the
caus
fluctu
are m
Wh
sudden
just to
years
becau
recom
in sto
tions
Alu
menti
of whi
283 lb
dropp
1895.
the r
3,000,
Alu
freadv
disadv
of the
to or
appli
The
paten
of the
favour
The ne
need re
tions
metall
calcium
Alu
one of
heat;
or dra
It is a
by all
for inv
the dec
been u
but in
makin
tin pla
will be
It wou
tunatu
chance
to 50 c
Sour
spite o
suppli
area.
of supp
experi
years, b
suppli
certain
ay co

MINOR MINERALS OF THE UNITED STATES.

By DAVID T. DAY.

(From the *Engineering Magazine*.)

THE mines of the United States yield an average annual product worth \$600,000,000. While this product fluctuates greatly according to industrial prosperity, it increases with the growth of population. Indeed, while our population increased only 25 per cent. from 1880 to 1890, the mineral product increased just three times as rapidly, or from \$350,000,000 to \$619,000,000. We should, therefore, in 1900 normally produce about an even billion dollars in minerals.

We record about 50 mineral industries, each contributing a distinct product. Nevertheless, nine-tenths of the total is furnished by a dozen minerals, and more than a third by two—coal and iron. The rest are the minor minerals.

AVERAGE VALUE OF MINERAL PRODUCTS OF THE UNITED STATES.

	Millions of Dollars.	Millions of Dollars.
Bituminous coal ..	120	Aluminum ..
Pig iron ..	100	Whetstones ..
Anthracite coal ..	85	Corundum ..
Silver ..	75	Feldspar ..
Building stone ..	45	Bromine ..
Gold ..	40	Barite ..
Copper ..	35	Grindstones ..
Petroleum ..	30	Mica ..
Natural gas ..	14	Manganese ..
Lead ..	12	Graphite ..
Clay ..	10	Antimony ..
Zinc ..	7	Sulphur ..
Cement ..	6	Fluorspar ..
Salt ..	5	Marl ..
Mineral water ..	4	Chrome iron ore ..
Phosphate rock ..	4	Infusorial earth ..
Limestone for iron flux ..	3	Millstones ..
Mineral paints ..	2	Nickel ..
Quicksilver ..	1	Cobalt ..
Borax ..	1	Tin ..
Soapstone ..	1	Magnesite ..
Gypsum ..	2-3	Asbestos ..
Pyrite ..	1	Platinum ..
Asphaltum ..	1	Rutile ..
Precious stones ..	1	1-3000

This classification, however, is not the popular one. Popularly speaking, any mineral is minor which is not frequently mentioned in the technical press; but with such a classification every chance discovery which should give mineral sudden and temporary notoriety would take it out of the list of minor minerals. Thus, one of our most popular mineral products is aluminium; yet it is a very minor mineral product, not worth a tenth of our salt. Tin is even a less considerable product in this country. Indeed, the total tin product of the world is not worth half as much as our common clay products, which make an aggregate value greater than either silver or gold.

Cement, salt, mineral water, phosphate rock, paints, borax, soapstone, asbestos, aluminium, nickel, cobalt, tin, platinum, quicksilver, antimony, gypsum, pyrite, precious stones, asphaltum, whetstones, bromine, bauxite, corundum, barite, manganese, graphite, sulphur, marl, chrome iron ore, infusorial earth, millstones, magnesite, and rutile are the products which we find in the minor mineral column of our mineral wealth. Of them the first six are always millionaires. Some of the others go beyond that limit, but fluctuate widely. The limiting reasons which keep these substances in the minor list are the most really interesting features of them. This limitation is due usually to one of three things—to a limited market, principally, but in other cases to the difficulty of finding a supply, and, again, to the fluctuations of other industries to which these mineral products are minor tributaries.

Where lack of supply is the trouble, the mineral has obtained a sudden popularity, to which there has not yet been time to adjust the producing conditions. This usually changes in a few years to a surfeited market, and a loss of interest in the mineral because of abundance. But where the mineral is a very secondary consideration in some other industry, like sheet mica in stove-making or quicksilver in gold amalgamation, its fluctuations are especially uncertain.

Aluminum.—Considering the minerals under the three heads mentioned, we find that aluminium is typical of the substances of which we cannot get enough. Its product has jumped from 283 lbs. in 1885 to 950,000 lbs. in 1895, while its price has dropped from \$8 per lb. in 1885, to a minimum of 35 cents in 1895. This total product is not great comparatively. Still, if the rapid increase continues, we should produce at least 3,000,000 lbs. in 1900.

Aluminium's popularity is due to its lightness, whiteness, and freedom from any considerable tendency to rust. It has certain disadvantages, but these are not so notable as is the lightness of the metal. Its production in this country is limited to one firm, in spite of hundreds of patents and applicants for patents for methods of making it. The producers have the best process known, and the patent has been shown to be good. It has not been the policy of the controlling company to offer royalty privileges in so favourable a way as to induce others to go into the manufacture. The nature of this simple process (Hall's) is too well known to need mention, but in its development, and in other investigations in search of new methods, much has been learned of metallurgy, and two valuable substances—carborundum and calcium carbide or acetylid—have been discovered.

Aluminium is an attractive substance for experiment. It is one of the best conductors of heat; it has a very high specific heat; it tarnishes, but does not rust readily. It is easily rolled or drawn into wire; it can be beaten into an extremely thin leaf. It is an ideal casting metal, and the possibilities of hardening it by alloys offer an extremely valuable and even fascinating field for investigation. It is over-used in many directions, but still the demand is beyond the supply. Singularly, most of it has been used in alloy with iron to improve iron and steel castings, but in the future, with decreasing prices, must go to making kitchen utensils, till it shall drive first copper, and then tin plate, from the field. If the price goes much lower, copper will be menaced in various fields—such as electric connections. It would then displace also roofing tin and terne plate. Unfortunately for this prospect, there seems comparatively little chance for reducing its cost much below the present rate of 35 to 50 cents.

Sources of Aluminum.—It is a somewhat curious fact that, in spite of the inability of the manufacturers of aluminium to supply the present demand, there is no scarcity of available ores. It is the common impression that clay is the main source of supply. As a matter of fact, aluminium made from clay is an experimental curiosity, and probably will remain so for many years, because there are richer sources which furnish an abundant supply. The supplies which have been drawn upon have varied greatly. The first aluminium made in the United States, in any considerable quantity was from Irish and French bauxites

but later bauxite, fairly free from silica, which was discovered in Alabama and Georgia, was used to a considerable extent, the members of the Pittsburg Reduction Company going so far as to acquire large deposits of it. Next, the far more abundant supplies of bauxite in Arkansas were experimented with, but proved too siliceous, a small amount of silica being as great a detriment in making aluminium by the Hall process as is the iron which is found as the considerable impurity in the bauxites of Alabama and Georgia. But, while the southern bauxite was being used in the manufacture of aluminium, being first sent to Syracuse, New York, where it was refined, and then shipped to Pittsburg for conversion into aluminium, the alumina from Greenland cryolite entered as a competing factor. Inasmuch as the alum into which this alumina normally goes has become a drug on the market at present, this source of supply controls the trade, and is likely to do so long as the quantity of aluminium is sufficient, which can be only for a short time. It will then remain an open question which of the various sources will be further drawn upon, with a possibility of using alumina obtained by a double decomposition of the phosphate of alumina which makes up the raw phosphates from Orchilla and other islands. It is possible to obtain phosphate of alumina in comparatively pure condition, not only from these islands, but from several points in Florida. It seems practicable to produce alumina in perfectly pure condition from this source, and to leave calcium phosphate in a condition suitable for the assimilation of plants without further treatment by acid, and to do this as cheaply as crude bauxite can be refined to the necessary extent for making aluminium. Evidently, therefore, there is a supply of aluminium ores sufficient to yield great quantities of the metal without the use of clay. And, before these supplies are exhausted, will come the question as to whether further supplies of bauxite are not liable to be found under the conditions present in the Coosa valley. They will be sought farther to the north-east in the Appalachian system, wherever the geological conditions are similar. These conditions seem to be a very complicated system of faulting extending through the Knox dolomite and into the underlying shales. Hayes has shown that where this faulting has taken place, it has admitted the downward percolation of water carrying atmospheric oxygen, which has oxidised the iron pyrite contained in these shales. The free sulphur which, in addition to ferrous sulphate, has resulted from this oxidation has dissolved out the alumina, and thus Nature has performed one stage of the conversion of clay into aluminium. First it made aluminium sulphate, and alum where the clay also contained potassium, and then this solution, passing upward, was acted upon by the Knox dolomite, forming gypsum and alumina, carbonic acid probably passing off into the air.

Magnesite.—Another mineral belonging in the group in which the supply is by no means equal to the demand is magnesium carbonate, which is in more or less demand according to the extent to which it has been concentrated as pure magnesite or, on the other hand, left with a large proportion of calcium carbonate, as dolomite. A map of the occurrence of magnesium minerals over the United States would show concentrations of this material wherever there is serpentine. We should think particularly of a more or less persistent system of such serpentine rocks in the Appalachian series, most noticeable in Maryland and eastern Pennsylvania, and again in western North Carolina—a series which will be referred to as the source of our deposits of chrome iron ore, nickel, and corundum. Here pure magnesite has been repeatedly noticed, but not in commercial quantities. Again, on the Pacific coast the occurrence of chrome iron ore in belts of serpentine has also been coincident with deposits of magnesite, and in this State there are beds, reported as from 5 to 6 feet thick in several cases, and in one case from 5 to 20 feet, which would be of considerable commercial importance if located near the points of consumption. But the total supply of magnesite so far found in the United States is entirely insignificant compared with the need of this material as a lining for basic open-hearth steel plants, and recourse has had to be made to dolomite as rich as possible in magnesia. The dolomites preferred for this purpose have been obtained, so far, principally in the neighbourhood of Bowling Green, Ohio, and other points where the dolomitic portions of the Trenton limestone are easily available; but in the future the Knox dolomite of Alabama and Georgia will become available, as in the course of time the accumulation of scrap iron in these southern States will admit of open-hearth steel works there. But the supply of this material must be in the neighbourhood of the points of consumption; hence dolomite containing anywhere from 20 per cent. to the theoretical 45 per cent. of magnesium carbonate and less than 1 per cent. of silica will be greatly sought in Western Pennsylvania, in Indiana, Ohio, and Illinois, and just at present in northern New York.

(To be continued.)

THE COPPER MINES OF LAKE SUPERIOR.

By W. P. KIBBLE.

NO one nowadays expects to open a copper mine on Lake Superior without a large preliminary expenditure of capital. It is frequently only by a large outlay that they can hope to succeed at all. The less the amount of copper in the rock, the more of the rock must be mined and stamped, in order to secure a product that shall insure the requisite income. A copper-bearing lode that yields only 20 lbs. or less of ingot copper to the ton of rock must be so worked that the cost of obtaining this 20 or less pounds shall at least not exceed the market value of the copper. But this difficult problem has been successfully solved. It is wonderful how thoroughly every factor which enters into it is considered, and its exact relation to the other elements understood and defined. Nowhere in the world is mining work in advance of that done in the copper region of Lake Superior. No improvement is lost sight of, every advantage is seized upon and rendered available, and every appliance brought into requisition is turned to the best account. The crude methods of early days have been discarded, and the miners of this district are in the vanguard of the world's mining industry. Comment is unnecessary when we consider that mining work is so conducted, as in the case of the Atlantic Mine, that a deposit which yields only 12-18 pounds of copper to the ton of rock is made to defray all expenditure connected therewith, in addition to laying up a substantial surplus year after year. This result is accomplished by daily mining and working up 750 tons of rock, and doing it at what would appear, were it not an actual fact, at an incredibly low cost—viz., 25-32 per cent.

Considerable uneasiness prevails among the managers of Lake Superior copper mines regarding the future of that mineral. The apprehension is entertained that the general dulness which has prevailed in copper circles throughout the country for three years past, together with the increased production of ingot

copper, may so far affect the market value of that article as to reduce it below the price at which it can be mined. It must be borne in mind that, leaving out the Calumet and Hecla, Tamarac and Quincy, the profits in copper mining on Lake Superior are, on the average, very moderate. Out of the 12 copper mines now working on company account on Lake Superior, only five paid dividends in 1895; and these returned in this manner to stockholders the sum of \$2,800,000. \$2,000,000 of this was paid by the Calumet and Hecla alone. The Calumet and Hecla pays annually a dividend of \$20 per share, which is not excessive when the market value of the stock is considered—about \$300 per share. To be sure, to the original holders it represents a large profit; to those who may have been fortunate enough to buy when the stock was low the advance is a great gain; but there is generally considerable risk which the original owners take upon themselves in opening and equipping a mine—as witness, the conglomerate on the Keweenaw peninsula of Lake Superior, which called \$900,000 of its capital stock in two years, all to be expended in equipping a property which afterwards proved worthless.

"Behold these ruins Philadelphia trust,
Fast crumbling into earthly dust."

A party of Philadelphia (Penn.) gentlemen came to the country, not a great many years ago, and purchased large tracks of land at the extreme end of the Keweenaw mineral peninsula, Lake Superior. They had conceived the idea that beneath the surface of their land

"There was a mine of wealth untold,
In a hundred fathoms deep."

Operations were begun for one of the greatest mining campaigns of the time. Huge shafts were sunk into mother earth. Great stone buildings were erected, behind whose four walls were installed the most modern machinery of the age. A stamp mill, one of the finest in the Michigan copper region, was built upon the shores of Lake Superior, while a railroad seven miles long, leading from the mine to the mill, was constructed, and equipped with locomotive ore cars and other rolling stock shipped from the far east. And the company built a canal leading from Lac La Belle to the open nature of the great Gitchigamme—Lake Superior. Row after row of substantial dwellings were erected upon the ground, and finally, when all was in readiness, the great mogul whistle awoke a peaceful hamlet from the dead. The powerful engines began to roll. The tall smoke stacks were vomiting forth their torrents of black smoke and steam. Down, down, down, went the multitude of miners into the bowels of the earth, and up, up, up, came the great steel skips loaded with barren conglomerate. There was a mine there, it is true, but it was in the minds of the originator.

And there to-day stands the deserted village, the fine machinery reeking in rust, and the massive buildings that house them bleaching in the sun and rotting in the rain—silent as the potente originator, H. Davis, deceased.

Directly across from Lac La Belle, and situated in the middle of Lake Superior, is the Isle of Royale. It was here that an English syndicate, headed by W. F. Richie, of London, spent two years, and a great deal of money, trying to find a copper mine. Nothing of value was found, however, and the island is now deserted save for the deer and other animals that haunt its primeval forests.

Surface Workings.—Calumet and Hecla Mine.

No other corporation in the world offers so many advantages to the student of mining affairs as the Calumet and Hecla. The surface workings, which extend over 2 miles of territory, are a literal exposition of the finest and most powerful machinery known to the art of mining.

As in the past, improvements and experiments are on a grand scale. An absence of a few months makes the visitor wonder—Can it be the same mine? Old trestle roads and wooden pump rods that formerly obscured the view have gone; old shaft houses and rock houses that stood for three decades have disappeared, and the new combined shaft and rock houses have taken their places. The latter are monster buildings 25 by 45 feet, built straight up from the ground, and three stories high. Altogether, there are 11 of these buildings, extending over 2 miles in length.

The difference between the two systems is mainly that in the old the rock was conveyed from the several shafts by trestle roads, an endless rope system to one or more centrally located rock houses, from whence the rock was conveyed to the mill by rail, whereas in the combination rock house the rock is dumped almost directly into the crushers and thence into the cars.

The Calumet and Hecla stamp mill is situated at Lake Linden, Mich., and is the largest of the kind in the world. There are practically two mills of 11 ball heads each, and have a combined treating capacity of 5000 tons of ore per day.

The metal is found deposited in the rock in all possible forms. The separation of the copper from the rock is effected by passing the stamped rock over a system of arranged jigs, whereby the sand, by its less specific gravity, is floated off into a steady current of water, and the copper, being the heavier, settles and falls through a series of seives. One line of jigs follows another, over which in succession the copper, which has just passed through previous set of seives, is made to pass, and the sand which is sustained in the water is carried away by the current of water to the lake. The number of jigs and the velocity of the current are so regulated as to secure the desired separation with very little loss of copper. The Evans slime table is an important adjunct in copper washing. Its use in saving copper from the waste—that is, the minute particles—is pre-eminent. The head current of water coming from the stamp heads, in which float the light copper and fine dirt, is turned from the main launder into lateral ducts, which convey it to the large slime tables, over whose conical shaped, slow-moving surface it is made to pass.

It can scarcely be comprehended that this branch of mining work has been so perfected as to bring the entire cost of stamping and washing a ton of ore down to 33 cents.

The Calumet and Hecla Company have seven locomotives at the mine, two of which are kept in reserve.

The lode is generally from 8 to 10 feet in width, is very uniform, and is all taken down except as left for the pillars at the shafts. The only rock wasted is the small percentage of trap that falls out from the hanging wall. The work underground is conducted with great regularity. The levels are uniformly the same distance apart, and are in all respects precisely similar. There are two man engines for the men to descend into the mine and come out of it, one for each end of the mine, besides the cages at the Red Jacket shaft. The drilling is all with power drills; the work of drilling, drifting, stoping, trammimg, &c., is all done on contract. A third to a quarter of the force underground is constantly engaged in putting in timbers. There are 10 working shafts, and the levels are 90 feet apart on the lay. Steel skips are used, carrying about 2 tons load, varying with the size of the rock. The run is made at the rate of 425 feet per minute. The openings are at the time of writing 10 years in advance of the stoping, and no change is observed in the width or richness of the deposit.

(To be continued.)

C. PASS & SON (Limited), BRISTOL,
ARE BUYERS OF
LEAD ASHES, SULPHATE OF LEAD, LEAD SLAGS,
ANTIMONIAL LEAD, COPPER MATTE, TIN ASHES, &c.
and DROSS or ORES containing
TIN, COPPER, LEAD, AND ANTIMONY.

**HENRY WIGGIN & CO. (Limited),
NICKEL AND COBALT REFINERS,
MAKERS OF BEST RED LEAD FOR FLINT GLASS
MANUFACTURERS,
BIRMINGHAM.**

GILLIARD and HOLT,
(Established 1872)
**SHIPPING and FORWARDING AGENTS TO
MINING and ESTATE COMPANIES.**
Agents at Principal South African, Australian, and New
Zealand Ports.
150, LEADENHALL STREET, LONDON, E.C.

**LAMBERT'S WHARFAGE CO.,
PRINCE OF WALES DOCK, SWANSEA.**

Ores, Mattes Regulus, and Bars received and prepared for market.
Copper, Lead, Tin, Spelter, and Pig Iron Received, Weighed, and
Sampled, and Warrants issued against same.

N.B.—Warrants are on Accepted List of London Metal Exchange.

Regular lines of steamers from America, Europe, &c.

Good prices can be obtained for low produce Copper Ores. Send
air samples of not less than half a pound.

**THE AUSTRALIAN GOLD RECOVERY
COMPANY (Limited).**

(MACARTHUR-FORREST PROCESS).

All information and terms regarding Plants and the Licensing of
this Process can be obtained on application to:

**THE AUSTRALIAN GOLD RECOVERY CO. (Ltd.),
23, College Hill, London, E.C.**

JAMES R. FOWLER, Esq., 14, King William Street
Adelaide; or

GORDON WILSON, Esq., The Australian Gold Recovery Company (Limited), Charters Towers, North Queensland.

**AGENTS FOR THE CASSEL GOLD EXTRACTING COMPANY'S
MANUFACTURES OF HIGH GRADE CYANIDE.**

WESTERN AUSTRALIA.

MERCHANTS AND FORWARDING AGENTS.

J. H. MONGER AND CO. (LIMITED) are prepared to
RECEIVE CONSIGNMENTS of MACHINERY and
GENERAL GOODS for clearance through Customs at Fremantle,
and despatch to the Gold Fields.

Having houses both at Coolgardie and Kalgoorlie, they possess
unusual facilities for despatching from there either by Waggon or
Camels to any part of the Eastern Gold Fields.

They are in a position to despatch all consignments expeditiously
from Fremantle, and from Coolgardie or Kalgoorlie.

Head Office, Coolgardie.

Branches, { Fremantle.

Reference. Western Australian Bank.

London Agency, 11, Leadenhall Street, E.C.

COMPANIES AND LEGAL ANNOUNCEMENTS.

* Advertisements are inserted in this column at the rate of
9d. per line, with a minimum charge of 7s. 6d.

THE NAMAQUA COPPER COMPANY (LIMITED).

NOTICE IS HEREBY GIVEN, that the NINTH ORDINARY
GENERAL MEETING of the Shareholders of this Company
will be held at the Terminus Hotel, Cannon Street, in the City of
London, on TUESDAY, the 30th day of June, 1896, at 2.30 p.m.,
in order to receive the Report of the Directors and the Statement of
Accounts made up to the 31st December, 1895; and to transact
such other business as may be incidental to the Meeting.

Holders of Share Warrants to Bearer will receive a Ticket of
Admission to the Meeting on depositing their Warrants at the
Company's Office, in accordance with the Articles of Association,
two clear days previous to the Meeting.

The Transfer Books will be closed from Tuesday, the 23rd day of
June, to Tuesday, the 30th day of June, both days inclusively.

By Order of the Board,

C. LEWIS BENNETT, Secretary.
34, Leadenhall Buildings, Gracechurch Street,
London, E.C., 22nd Junr, 1896.

THE BALAGHAT MYSORE MINES (LIMITED).

NOTICE IS HEREBY GIVEN, that the ORDINARY GENERAL
MEETING of this Company will be held at the Caenon Street
Hotel, in the City of London, on TUESDAY, the 30th day of June,
1896, at 11.30 a.m.

To receive the Reports and Accounts.

To elect Director and Auditors; and for other General Business.
By Order of the Board,

L. CROCKER, Secretary.

Registered Offices:
6 and 7, Queen Street Place,
London, E.C., 20th June, 1896.

PLAYA DE ORO MINING COMPANY.

THE COMPANY, having now available over £40,000 for the ex-
tension and completion of its hydraulic plant, has instructed us
to withdraw the balance of its Treasury Shares from the market.

In order to facilitate transactions in the Shares of the Company,
which are not listed on the Stock Exchange, we request persons
desirous of buying or selling to communicate with us.

MAGUIRE, RAUCUS, and STAPLETON.
Dashwood House (Ground Floor), 9, New Broad Street,
London, E.C.

NORTH QUEENSLAND REGISTER.

THE LEADING NORTH QUEENSLAND WEEKLY.

PUBLISHED AT CHARTERS TOWERS, NORTH QUEENSLAND.

MINING A SPECIALITY.

Subscription £1 1s. per annum; including postage to Great Britain

£1 5s. per annum.

Address communications to—
THE NORTHERN MINER PRINTING AND PUBLISHING COMPANY
CHARTERS TOWERS, QUEENSLAND.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

An Illustrated Record of Mining, Metallurgical, Railway,
Financial, Industrial, and Engineering Progress.

ESTABLISHED IN 1835.

THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE, published every SATURDAY MORNING, price SIXPENCE, is recognised throughout the World as being the oldest, most influential, and most widely circulated Journal devoted to the interests which it represents. It circulates

ALL OVER THE WORLD.

Amongst Mine Owners, Capitalists, Investors, Mining, Metallurgical Engineers, Manufacturers, &c., &c.

THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE has correspondents and sources of information in almost every quarter of the globe. Its policy is absolutely independent; its circulation is cosmopolitan.

THE MINING JOURNAL is neither controlled, nor is any interest in it held or exercised, by any mine owner, speculator, or syndicate; and it is in no way connected with any share-dealing agency.

TO CORRESPONDENTS.

Letters on Editorial Matters, or containing literary contributions should be addressed to "THE EDITOR." All matter intended for insertion must be written on one side of the paper only. The return of rejected manuscripts cannot be guaranteed. The Editor invites correspondence and items of news or information from readers in all parts of the World.

TO SUBSCRIBERS.

The Annual Subscription to THE MINING JOURNAL, including postage, is for:—

The United Kingdom, £1 4s.;

Abrd., £1 8s.;

payable half-yearly in advance. It can be purchased at all Railway Book-stalls and Newsagents throughout the United Kingdom for 5d.

TO ADVERTISERS.

The following is an abbreviated Scale of Charges for Advertising:—Companies' Prospects, £1 12s. per column, or £20 per page; Companies' or Legal Announcements, 9s. per line, with a Minimum charge of 7s. 6d.; Sales by Auction, Publications, For Sale, Wanted, &c., &c., 5d. per line with a Minimum charge of 4s.

Displayed (Trade) Advertisements of 2 inches in depth (or more), Single Column measure, will be inserted at the following rates:—For 52 insertions 2s. 6d. per insertion for each inch in depth; for 26 insertions 3s. per insertion for each inch in depth; for 13 insertions 3s. 6d. per insertion for each inch in depth. Terms for special positions and contracts may be had on application.

ADVERTISEMENTS

(which should in all cases be sent direct to THE BUSINESS MANAGER) can now be received for the forthcoming issue of THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE, on FRIDAY, at 18, FINCH LANE, E.C., up till 6 p.m., and at 3, DORSET BUILDINGS, SALISBURY SQUARE, E.C. until 9 P.M.

Editorial and Advertisement Offices:

18, FINCH LANE, LONDON, E.C.

Telegraphic and Cablegraphic Address: "TUTWORK, LONDON."

Codes used: "A.B.C." Morse's, and "Universal."

CONTENTS

Of this Number of "The Mining Journal, Railway and Commercial Gazette," June 27, 1896.

NEW PATENTS...	813
JOINT STOCK COMPANIES—New Registrations	813
CONTRACTS OPEN...	813
WIRE MINING ROPES...	814
MINING IN VICTORIA...	815
THE WATER DIFFICULTY IN WESTERN AUSTRALIA...	815
THE PRESENT POSITION OF GOLD MINING IN WEST AUSTRALIA...	815
ROYAL AGRICULTURAL SHOW AT LEICESTER...	817
MEETINGS OF MINING COMPANIES—	
Rand Rhodesia, New Vancouver Coal, City & Colonial Syndicate	817
St. John Del Rey, African and Australian Gold Fields	818
British Broken Hill Proprietary, Trust Francois (Lim ted)	819
MINING IN CORNWALL AND DEVON...	819
COMPLIMENTARY DINNER TO MR. PRITCHARD-MORGAN...	820
SEPARATION OF SILVER FROM GOLD BY VOL. UTILISATION...	820
SOME NOTES ON THE MOUNT LYELL MINE, TASMANIA...	820
DIARY FOR NEXT WEEK...	821
CORRESPONDENCE...	821
REVIEWS...	822
ANCIENT MINING...	822
MINOR MINERALS OF THE UNITED STATES...	823
THE COPPER MINES OF LAKE SUPERIOR...	823
LEADING ARTICLES—	
The Future of Western Australia...	824
Progress in British Guiana, St. John Del Rey, The Water Difficulties in Western Australia, Mining in Victoria, The Croydon Gold Field	825
Honours for a Mining Engineer, Balaghat Mysore, Labour on the Rand, Sutherland Beef, Broken Hill Proprietary Block 10, Tolima Mining Company...	825
DEATH OF SIR JOSEPH PRESTWICH...	826
THE MINING MARKET...	827
THE METAL MARKETS—	
The London Metal Market...	827
COMPANY FINANCE...	827
THE MINING JOURNAL" SHARE LIST...	828 829
LATEST FROM THE MINES: Cablesgrams and Telegrams...	830
REPORTS FROM THE MINES...	830
BRITISH GUIANA'S GOLD INDUSTRY...	835
PROVINCIAL SHARE MARKETS...	835
BLACK REEF AT NATAL SPRUIT...	835
ADVERTISEMENTS—(See Index to Trade Advertisements, p. 108).	836

LONDON: JUNE 27, 1896.

THE FUTURE OF WESTERN AUSTRALIA.

WE have no doubt that our readers have read with interest and due attention the translation of BERGRATH CARL SCHMEISSER's report, which we conclude in this issue.

MARK TWAIN, who knows as much as most men, advises "not to prophecy until you know;" but sound as the advice is, it cannot always be followed; mining engineers have to prophecy sometimes. At any rate, there is this much to be said about Herr SCHMEISSER's predictions. We all believed his predictions about the Transvaal mines with the utmost readiness; why should we disbelieve his report on Western Australia, although it is less favourable than we would like to see it? It is human nature, of course, only to believe what suits us; but at the same time we cannot help seeing that there is a great deal of sound common sense in what Herr SCHMEISSER says, and it is always well to face unpleasant facts squarely. As far as *The Mining Journal* is concerned, though we have not been able to speak with the precise knowledge of such a special report, but the sum of what we have said very often, is not very unlike the gist of Herr SCHMEISSER's report as far, at any rate, as it concerns the gold mining investor. We are, for the time being, leaving out of sight the valuable scientific information which this report contains, and will leave the geological problems it advances to the geologist. We are only concerned for the nonce with the business aspect of the case.

It would be difficult to say how much money has actually

been invested in Western Australia, but it certainly amounts

to a good many millions sterling. Making every allowance for

the amount of gold that has been carried off without being

entered at the Customs, the gold production for 1895 was under

£1,000,000 sterling; not enough, probably, to pay a decent di-

vidend upon the capital of West Australian companies, even if

it were all profit, which it is very far from being. And yet if

we interpret Herr SCHMEISSER's views correctly, no great im-

provement is to be looked for yet awhile. The alluvial gold

is exhausted, he says, and as the reefs are opened

in depth they get much poorer. That this last

statement is true is undeniable. The deepest mine

in the colony is Bayley's Reward, and this mine, which began with

a yield of 15 ounces, or thereabouts, is now getting some 15 dwt.

to the ton. As to whether the increasing amount of ore to be

worked will counterbalance its diminished richness is a question

that even Herr SCHMEISSER does evidently not venture upon

answering; we can only hope that it will. Every gold miner

knows that phenomenally rich mines never made a gold field

yet; it is the steady low grade propositions which handle large

quantities of poor ore, that make the successful gold mines. We

suppose that quite three-quarters of the reef gold of the world

to-day is produced by ores that yield under an ounce to

the ton. There is, therefore, no need to despair of the

future of Western Australia; there are difficulties to be

overcome; great difficulties no doubt, but none that seem in-

superable. To those who remember Witwatersrand, or even

more striking, Kimberley, in the earliest days, the obstacles

found correct, or controverted if they can be disproved, rather than imply ignored or concealed.

PROGRESS IN BRITISH GUIANA.

NO TWITHSTANDING the troubous nature of the political outlook in that country, British Guiana is evidently making genuine and solid progress in the direction of financial and industrial prosperity. Undisturbed by neighbourhood with the boisterous little Republic whose politicians are relieving the tension of the internal situation by grasping at the territory of the neighbouring power, to whom they owe their independence, the leading men in Guiana are carefully perfecting the economical conditions obtaining in their colony, so as to secure the greatest possible measure of advantage to its commercial future. It is easy to read as much in the pithy reports which are continually to hand from indefatigable correspondents in the colony, who allow little to occur, no matter how slight its importance, without sending advices to the home circles. The most momentous works which are now being carried out in the colony are undoubtedly those of improving and increasing the means of internal communication. An indispensable preliminary to all mining development is undoubtedly the provision of some light railway communication, or, at least, good roads. It is hoped that in gold the colony will find a satisfactory succedaneum for sugar, and the establishment of mining upon a permanent basis presupposes the creation of facilities for the conveyance of mining machinery between the different mining centres, and, above all, inwards from the coast. Evidently the local world is fully alive to the prime necessity of this work, and they are setting about it with prudent expedition. The colony is fortunate in possessing many noble rivers, which achieve the dual end of superb scenic effect and complete navigableness. Without these broad watercourses, which form so many highways into the interior, it is probable that the discovery of gold and the exploration of the inner country would have been delayed almost indefinitely. The policy which the colonists are now pursuing aims at no sweeping innovation and burdensome expenditure. They have had the wisdom to turn to account the means already to hand, and to knit together a threefold system of roads, railways, and rivers. The projected construction of a railway from Wismar, on the Demerara River, to a point on the Essequibo River, strikingly illustrates this. Upon its completion towards the last months of this year heavily freighted steamers will be able to pass up the river from Georgetown to Wismar, whence a light railway will convey goods to a point above the falls on the lower Essequibo reaches. Another light railway is also in course of construction to connect the mines in the Barima district with the waterside. The opening up of this important district, with its phenomenal quartz products, is nothing less than an epoch in the industrial history of the colony; and in estimating the present record of this group of mines it must not be forgotten that they are being worked under all the disadvantages which invariably afflict pioneers in mining enterprise. No matter what the colonial patriots may say in moments of enthusiasm, the gold industry in many districts of British Guiana is still in an early stage of trial, so that it would be easy to fall into the error of expecting too large a production. In forecasting the colony's future, it is important to remember that Guiana has no ground for complaint in the attitude at present assumed by the authorities. There is, on the contrary, every reason to believe that everything which experience could suggest has been done by Government to foster and promote industrial expansion. A new code of mining regulations has just been gazetted, formulating the conditions upon which mining is to be pursued, and though when submitted to the test of actual working it may be found imperfect in some minor, and, perhaps, even some crucial points, there is no reason to suppose, as those who have the best means of forming judgments on the spot are ready to allow, that they will not be found to represent a well considered attempt to wisely condition a branch of industry which is expected in the future to yield such solid benefits to British Guiana. With that graceful facility which is the distinguishing mark of destructive criticism, a number of writers have taken exception to the regulations in comparatively insignificant details, but the gravamen of the objections they have made lies in the late period at which they have been put into force. Perhaps it may be well to point out that greater haste in the framing of these regulations might have been productive of much harm, and have occasioned their disfigurement in weightier matters than have hitherto incurred censorial rebuke from the colonial newspapers. After all, the working character of the code will largely lie in the manner of its administration, and, if wisely and temperately applied, there is little ground for doubting that it will be found to discharge its purpose adequately. Amendments may afterwards be made so as to bring the code into closer conformity with the peculiar character of the industry in Guiana, but in all essentials the code will probably remain as at present constituted. The royalty imposed is set at 90 cents for each ounce of gold, and 4 cents for each ounce of silver, "or such amount as may from time to time be fixed by the Governor-in-Council"—a figure and an arrangement which will appeal to business men as at once moderate and sound. So far as the internal political condition obtaining in the colony may be thought to influence the local industries, there is no ground for fearing that any prejudicial effects will be produced from these sources. The conclusion seems justified that it would be difficult to find a colony where there was a happier admixture of patriotism, enterprise, and good social feeling. The home Government is represented in the colony by a gentleman who does a good deal towards making the wheels of administration move easily, and who discharges with great amiability the duties falling to his high office. There is, it will thus be seen, every reason to hope that a long period of industrial prosperity lies before British Guiana, and that the auriferous wealth, which, according to the best authorities, lies latent in the colony, will be the basis of sound and permanent well-being.

ST. JOHN DEL REY.

A STUDY of the report of the directors of the St. John Del Rey Company, which was presented at last Thursday's meeting, reveals the encouraging fact that the difficulties which have in a great measure retarded progress for some time now, and which have occasioned considerable anxiety to the board and superintendent, are being steadily but most surely surmounted, and in this there is every encouragement to the shareholders to look forward hopefully to the results of future operations. The great obstacle against which they have had to contend during the past year has been the insufficiency of water, and in consequence of this the returns have not come up to the figures which might reasonably have been expected. We reproduce the following table, which gives the record of the past 12 months:

Date.	No. of stamp- w'king.	Tons.		Yield per ton, Oitavas.	Total.	
		Raised.	Crushed.		Oitavas.	Ounces.
March ...	70	4786	3654	6·41	23450	2703·4
April ...	70	5610	4688	6·40	29692	3423
May ...	70	6123	4854	6·17	29227	3369·3
June ...	70	5083	4295	7·12	30120	3472·3
July ...	70	6398	4913	6·29	30566·5	3523·7
August ...	70	5841	4573	6·38	28692·5	3307·7
September ...	80	6065	4567	5·52	24968·5	2878·4
October ...	100	7224	5499	4·66	24727·5	2850·6
November ...	100	6660	5481	4·63	24797	2858·6
December ...	100	6438	5485	5·78	30936·5	3566·4
January, 1896 ...	100	6458	5503	4·76	25509·5	2940·7
February, "	100	6208	5356	5·46	28584·5	3295·2
		72894	58868		331271·5	38189·3

From this table it will be apparent at once what a great effect the insufficiency of water has had upon the returns. Whilst 70 stamps were in operation from March until August, and which crushed 4470 tons per month, 100 stamps only crushed 5300 tons instead of 6400 tons per month, which should have been the due proportion. The table also reveals the fact that after rejecting 20 per cent. of the mineral raised, the average yield of gold was only 5·61 oitavas a ton, from which the directors conclude that the duty actually done per stamp head, being far in excess of that done by the old mills, leaves a larger percentage of gold unfreed and inaccessible to treatment by quicksilver. For both these obstacles the directors have been successful in devising remedies. To overcome the water difficulty additional power will be obtained at comparatively small expense by embanking a stream and constructing a dam between two hills, through which the river passes, thus raising the height of the water. By then conducting it in a rego for about 700 yards a fall of water will be obtained equal to 100 effective horse-power in the dry season, and 150 in the wet. In order to remedy the low recovery of the gold contents, the whole of the concentrates, amounting on an average to 20 per cent. of the mineral crushed, will, including the concentrates which have been treated by quicksilver, be put into vessels, and treated with solution under atmospheric pressure by which 70 to 80 per cent. of the gold contents will be recovered. By the combined first and second processes the superintendent fully expects to recover 80 per cent. of the original gold contents of the mineral. After deducting duty and payment to the Rio agents, the profit at the mine amounted to £38,487 18s. 8d. After deducting London expenses and the bond and other interest for the year there remains a balance of £12,054 8s. 3d., from which the directors are writing off the excess of interest over profit for the four months to February 28, 1895—viz., £3905 7s. 7d., and to carry the balance forward. The directors do not regard the profit of £12,000 as any criterion of further profits, for, instead of crushing 60,000 tons per annum, nearly 80,000 will be crushed, with a recovery of 80 per cent., instead of 66 per cent. of the original gold contents of the mineral. If shareholders will study the speech of Mr. TENDON, delivered at last Thursday's meeting, they must be greatly encouraged. It was a model of lucidity, combined with reserve, and proves that the right men are ready and eager to make the most of promising opportunities.

THE WATER DIFFICULTY IN WESTERN AUSTRALIA.

ELSEWHERE we publish a momentous article on this engrossing subject from the pen of Mr. RAYMOND RADCLYFFE, an authority whose opinions should have the greatest weight inasmuch as he is on the spot, and is able to judge from personal observation, and not from hearsay. The future of Western Australia is dependent upon water. Without it the industry is in jeopardy, notwithstanding the success already attained by the dry-crushing process. It, therefore, behoves investors, who have sunk enormous capital in this industry, to seriously study this question, and to exert themselves to address the right quarters whence the remedy can be supplied. We know that their fears and doubts upon this head are being allayed by the statements of Chairmen at public meetings, by statements in prospectuses, and by the utterances of other persons who have everything to gain by making light of this obstacle, and a great deal to lose by a truthful representation of the situation. Mr. RADCLYFFE's article tells a different tale, and should vigorously arouse them to the true and momentous position of affairs. Mr. RADCLYFFE goes so far as to say that a solution of the difficulty is as far off as it was two years ago. There is any amount of rich reef in the colony which cannot pay to work owing to the scarcity of water. Take Bayley's Reward as an instance. Here there are many thousands of tons of 1 ounce stone which will not pay for crushing, but which would yield handsome dividends were some good water scheme established. But it can be done, and Mr. RADCLYFFE points out how, and what a great deal depends upon the

efforts of the investor. At the 90-Mile there are literally millions of tons of quartz waiting for an ample water supply, the Caledonian mill being run only upon the richer stone in the mines. At the Black Flag Proprietary there is enough stone to keep a 100 head battery going for years, but here, again, they will not be able to run more than 20 or 30 head with their present supply. But what is most surprising is that at Hannan's—that rich and famous district, where are situated some of the most promising mines—the difficulty is acute, for have we not been told, over and over again, at company meetings, that the water supply here is fairly plentiful? This is, indeed, a rude shock, for, if anywhere, we thought that at Hannan's the difficulty had been, in a great measure, solved. But even the prospects of this magnificent district are minimised by the scarcity of water, and though some of the principal mines are doing very well, they are not achieving the results which should attend them if better conditions prevailed. Now, it is in the power of the Government to solve this problem, but Mr. RADCLYFFE accuses them of lethargy in the matter. They want arousing, and investors are the persons who should take this in hand. In the words of the writer:—"The reason I write this is to urge upon the London shareholders to combine to force this water question upon the Government. They will not find Sir JOHN FORREST unreasonable. He is a shrewd, hard-headed man of business, but he is also a politician who knows that he can do no more unless he has the initial force behind him. Give him the start he wants, the pressure of public opinion, and he will soon bestir himself. At present he has been content to establish an efficient water supply for man and beast along the colonial roads. He must now take a farther step and supply the mines themselves, or let someone else do it. It can be done; any amount of money would be subscribed in a few hours to find the required capital. It would pay either the State or a corporation. I am afraid the latter is out of all question without a monopoly. That will never be granted in democratic Western Australia. The newly-established Mineowners' Association, which began operations in Perth a few weeks ago, might make the water question their battle ground, but they must get support in London. London shareholders should clearly understand that unless water is soon pumped up into the gold fields, the result will be a collapse of all mining operations. Water, water alone, means dividends. Surely this temptation is strong enough to rouse even the most lethargic shareholders." And Mr. RADCLYFFE's utterances are in a great measure supported by Herr SCHMEISSER as will be perceived in the translation of his report, which appears elsewhere. There is little doubt, therefore, that the situation is most serious, but it can be relieved somewhat if the counsel of Mr. RADCLYFFE is vigorously acted upon.

MINING IN VICTORIA.

WE must ask our readers to carefully study our correspondent's article on "Mining in Victoria," for they are likely to gain considerable benefit thereby. There the important announcement is made that Mr. WILLIAM KNOX, of Broken Hill fame, is proceeding to London with a group of mines "eclipsing in magnitude all prior achievements." All the leases belonging to companies or syndicates known as the Curtin-Davis Mines, on the Dundas fields, Tasmania, are being amalgamated for flotation under this gentleman's superintendence. In the colony these properties have a great reputation, and are looked upon as a rich prize, hence they should be carefully weighed by the English investor, when he is invited to put his capital into them. But other properties are coming to England of a less promising character, among them the Helmsford claim, which has been condemned by a prominent Victorian expert. Of course, experts are not infallible, and it is possible for the most skilful to commit an error. But investors need be in little doubt, if, before subscribing, they insist upon an independent examination being made by some other eminent and reliable expert. Otherwise, considering the present condition of the property, and the amount of work that must be undertaken before anything tangible can result, the risk would be too great. It would be a great pity if, now that Victoria is redeeming her past and giving evidence of her immense richness, capital should be spent upon properties with unpromising prospects, and if the only result should be failure and loss.

THE CROYDON GOLD FIELD.

The report of Mr. PARKINSON, the Warden, on the results obtained from the working of the Croydon gold field during the first quarter of the present year, together with an opinion as to the future prospects of this Queensland field, may be characterised as a very clear and comprehensive one. The writer has evidently very carefully examined the various operations which are being carried on in this part of Australia; and, therefore being so eminently qualified to give an opinion on the field, those interested in ventures over which he exercises his jurisdiction, may in face of the very encouraging report he makes congratulate themselves on having so profitably laid out their capital, or, at any rate, a portion of it. During the quarter under review the yield of gold showed a slight increase over that of the corresponding period of last year, but, strange to say, the tonnage of stone treated was less; 10,515 tons of ore were crushed for a yield of about 16,391 ounces, giving an average of 1 ounce 11 dwts. 14 grains per ton. Besides this 9431 tons of tailings were treated by the cyanide process, and resulted in the extraction of the further quantity of 7817 ounces of gold, thus making a grand total for the 13 months of about 24,204 ounces. That the increase in the yield should have occurred during a season when many unforeseen difficulties had to be encountered tends to give additional proof to the fact that the Croydon field is now opening up in a very gratifying manner. The writer of the report also points out, with apparent satisfaction, that several areas, both old abandoned and new ones, are being quickly taken up

and prospecting work is being energetically carried on. In dealing in detail with the various districts on the field, Mr. PARKINSON first alludes to the Golden Gate, where he says some of the mines are raising splendid stone, and it is anticipated that the yield will be substantially increased if an ample supply of water is secured for all seasons of the year. In the Waratah district 131 tons of stone were found to be worth £16 a ton, or in the aggregate £2096. The development of the Glenoco Mine is at present only in the preliminary stages, but when the crushing plant is erected—and it should be in working order by this time—the results will be eagerly watched, as there are several reefs of the same description to be found in the neighbourhood. On the whole, very good progress has been made at all the camps in spite of the fact that in consequence of the heavy rains a 14 days' exemption was granted to every portion of the field. Mr. PARKINSON concludes with the following highly-pleasing remarks:—"Judging by the outlook of the field at the present time I think it will be shown at the end of the year that the same progressive results have been obtained that have been shown in previous years. The inhabitants are contented, and business houses are apparently doing a satisfactory trade. One sign of the progress of the field is the introduction of steam power in one of the newspaper offices, which before was run by hand."

HONOURS FOR A MINING ENGINEER.

The mining community, and especially old and present students of the School of Mines, will be proud to hear of the honour conferred this week upon Professor HENRY LOUIS, by the University of Durham. At the annual dinner of the School of Mines, Professor C. LE NEVE FOSTER alluded in flattering terms to the distinction recently passed upon Mr. LOUIS of Professor of the Durham College of Science, for it was an honour likewise indirectly conferred upon the famous school at which he was a pupil. Professor LOUIS' abilities have received a still further recognition by the University of Durham, who, by a vote of convocation on Tuesday last, conferred upon him the honorary degree of M.A. This is all the more to be prized, inasmuch as any University very rarely thinks of honouring technical science, especially in the case of mining men. They could scarcely have chosen one more worthy of the honour than Professor LOUIS. The latter's career, ever since he learnt the rudiments of the profession, has been most distinguished, and his experience in mining in all its branches, embracing every quarter of the globe, is as wonderful as it is vast. For the Professor is still but a young man, and likely to live a great number of years to shed lustre upon the profession of which he is so worthy an ornament. He is an old London School boy, where, in 1873, he gained the Queen's Exhibition to the Royal School of Mines. There he took also the first Government Scholarship for the first year's students; the Duke of Cornwall's Scholarship for the second year; and the Dr. Le Beche Medal, with the Associateship of the School of Mines in Mining and Metallurgy in 1876. He next spent some six months in the private laboratory of the late Dr. PARCY, and afterwards went to Nova Scotia, engaging in iron mining and smelting. He also spent some time in the Eastern States of the American Union. Two years more he spent in England, chiefly in iron and steel making, iron foundry practice and the manufacture of chilled castings. He next went to South America, engaging in gold mining, and afterwards visited the West Coast of Africa, where he spent 18 months in the same pursuit. Three more years he spent gold mining in South Africa, examining and reporting also upon various diamond mines. He is a Fellow of the Institute of Chemistry, Fellow of the Geological Society, a Member of the American Institute of Mining Engineers, the Mineralogical Society, and of the Iron and Steel Institute. Of recent times, his literary contributions have been prolific and widely read and studied, whilst his late book on gold-mining is becoming recognised as a standard work.

BALAGHAT MYSORE.

The directors of this company are not, unfortunately, in a position to present a very favourable and encouraging report to the shareholders upon the operations of the past year, nor are they able to hold out any strong inducement of an improvement taking place during the current 12 months. This is unfortunate for more than one reason, as it may not only cause disappointment to the shareholders of this mine in particular, but may to some extent give rise to discouragement in Indian mines in general. The latter, as we have pointed out on several occasions of late, have been a most active feature of the mining market, and in spite of the influences which have tended to depreciate the shares in other departments of the market, Indians have always risen superior to them, and commanded general attention and favour. But the effect which this report is likely to have upon the Indian market can only be slight, as no one looked forward to an altogether encouraging report. Then, again, Balaghat is not in the first flight of mining properties operating on the Colar gold field, and is, therefore, not likely to influence, in a great measure, investments in the more prosperous mines. The result of the past year's operations has been a loss of £4188 11s. 6d., and this sum has been carried to the profit and loss account, as also other items for depreciation of buildings, machinery, and plant, and debenture interest for the 12 months, thus increasing the amount of the debit account to £17,260 18s. 2d. During the first two months of the year the quartz milled amounted to 370 tons, which produced 176 ounces of gold, besides which 130 ounces were obtained from the final clean up in March, making the total production 306 ounces of bar gold. Owing to the operations in the deep workings at Ogle's and Haines's shafts having been suspended, the supply of quartz for the mill could not be maintained after the month of February. At

both these shafts no work has been done below the 270 feet level. At this depth the level south of Ogle's shaft was extended 310 feet 6 inches upon what is supposed to be the same lode as that which has opened out so well in the Prospect shaft in the adjoining Coromandel property. Mr. RICHARDS considers the prospects in this shaft of a very encouraging nature, and he thinks that the further prosecution of these workings in depth will be attended by profitable results. He also recommends the extension forward of one or more of the levels from Tennant's shaft, as, in his opinion, the Champion lode will, in all probability, be found of value in the ground opposite Ogle's shaft. The directors regret that they have not a more favourable statement to lay before the shareholders, but are hopeful that the current year's operations may be more satisfactory.

LABOUR ON THE RAND.

THE native Labour Department of the Chamber of Mines at Johannesburg is doing a useful work in combatting with all the energy and resource at its command the difficulty thrown in the way of mining operations by the scarcity of labour. Loud and long have been the complaints from mine managers as to the difficulty of securing an adequate staff of native labourers, and those who have followed carefully the returns from the chief mines will not require to be told that the scarcity in question has exerted a strong prejudicial effect upon outputs and dividends. Ultimately the Chamber of Mines took up the matter, and since it passed into their hands an undeniable improvement has taken place. At present some 1100 or 1200 "boys" are brought monthly into the mining district, which must go a long way towards alleviating the evils of the labour famine. This large measure of success will appear to be the more extraordinary in view of the inherent difficulty of the work which the department has had to perform, and which is not simplified or facilitated by the action of certain mine managers who have adopted the somewhat unusual course of paying a premium upon the native "boys." It is obvious that, if in certain quarters a premium is paid upon the workmen, the department will find it immensely more difficult to introduce labourers without making any payment at all. It seems, moreover, that the managers cherish a very potent objection to employing natives from any but the East Coast, which produces the effect of handicapping the department to a considerable degree. The managers in question are not, however, without justification for their preference, and the strong necessity that undoubtedly exists for a copious source of labour may well excuse and explain the most extreme measures that may be taken for protecting the company against the losses arising from an insufficient supply. Notwithstanding the scarcity, a movement is now on foot to decrease the wages paid to the natives. It is asserted that these men receive more wages than the white labourers at home, and that after a greater or less period of work in the mines they, in many instances, retire altogether from active service. A proposal is, therefore, before the managers to decrease the payments by 10s. a month, which, it is said, will effect, for the country at large, a considerable saving. There is ground for hoping that the South African industry will not long be oppressed by a labour famine since the matter has been taken up with such energy by the persons concerned—energy which bodes well for the ultimate settlement of the question. Should the law of compensation apply to the course of South African affairs—as there is every reason to suppose that it may do—the mining industry there should shortly enjoy a long period of uninterrupted calm as some compensation for the continued and prolonged disturbances which have affected the country during the past three months.

SUTHERLAND REEF.

We desire to express our sincere sympathy with the shareholders of this unfortunate company, who, once more, are asked to put their hands into their pockets for the further development of a mine which, as yet, has been far from realising anticipations. This time, however, we think the directors will have considerable difficulty in persuading the shareholders to subscribe more money, especially as no inducements of a very encouraging kind are held out to them, beyond the announcement that "further development has shown the payable ore at present opened up lies in a shoot about the main shaft, and it is imperative that extended operations to follow this shoot in depth, and to meet other shoots east and west, should be proceeded with as rapidly as possible, particularly in view of the great extent of the company's property—about a mile on the line of the reef." It was only in June of last year that £22,000 preference shares were issued to redeem about £10,000 debentures, and provide additional working capital. But these resources are now exhausted, and, in addition, debentures to the extent of £7500 have been issued. This money has been applied to the discharge of liabilities, and in driving to the extent of 2200 feet on the different levels. Early in this year a misfortune happened to the company by the breakdown of the pump which supplied the mill with water. As the manager was unable to replace it until the middle of May, this, of course, has occasioned serious loss, and in some measure accounts for the great expenditure of money during the past 12 months. That there is gold in the property is evidenced by the fact that from July of last year to April of this year 4612 ounces of gold were secured, realising about £18,000. The directors now propose, in order to raise the necessary money to carry on operations and to pay off the debentures and preference shares, to reconstruct the company with a nominal capital of £220,000 in shares of £1 each, to be issued as credited with 15s. paid. As we have already hinted, we shall be surprised if the shareholders are persuaded to support this scheme. They have long been disappointed and dissatisfied with the poor results of this company up to date, but there is no knowing, of course, how they will

regard the prospects. They may go to the meeting with the full intention of opposing reconstruction, or any other scheme for raising the capital, but there they may change their minds, and be prevailed upon to regard the future with hopefulness.

BROKEN HILL PROPRIETARY BLOCK 10.

We have to express our pleasure at the continued prosperity of this company, as evidenced by the half-yearly report just received by mail. Notwithstanding a serious interference with the mining operations by the fire in Block 11 of the Broken Hill Proprietary, and the considerable expense entailed thereby, and notwithstanding the large amount spent upon the new concentrating plant and other machinery, and the payment of £20,000 in dividends, the profit for the past half-year amounted to the respectable sum of £8355 12s. 8d. During the period under review 13,223 tons of ore from the dump were taken away, from which a net sum was received of £23,218 5s. 10d., equal to 35s. 1½d. per ton. There was left on hand a balance of about 13,000 tons, all of which has been sold on similar terms. In the accounts, this ore has been left standing at 20s. per ton, thus leaving a good margin for profit. The small concentrating plant has run with regularity, and treated 400 tons of crude ore in excess of that of the previous half-year. Owing, however, to unforeseen circumstances, the enlarged concentrating plant was not completed as soon as was anticipated. But the machinery is now getting gradually to work, and there is every reason to expect that during the current half-year the plant will treat from the present time at the rate of about 2000 tons of crude ore per week. In addition, the directors make the encouraging announcement that arrangements are being made to dispose of the entire output of concentrates for the next 12 months, estimated at about 25,000 tons, at a satisfactory price. As regards the prospects of the mine, no material change has taken place. They are certainly most encouraging.

TOLIMA MINING COMPANY.

The past year of this company has not been attended with much success. The profits have again been diminished, and, in addition, the working expenses have been increased; and what is even less encouraging is a reduction in the grade of the mineral. There is absolutely no reason, however, for the shareholders to be discouraged as to the future of the mine. In fact, confidence seems justified by its present position, and by the existence of many encouraging points. The reserves, for instance, are very great. At the end of last December it was estimated that there was enough mineral in hand adequate for 2½ years working at the present rate of extraction. Then again, encouragement should be gleaned from the fact that the most advanced exploratory stations are all in productive mineral. The superintendent refers with satisfaction that the mine has now 32 working points, whereas at the close of 1894 it had only 29, whilst he is encouraged by the improvement of the grade of mineral during the second half of last year, which showed an increase of 16 ounces per ton over the average value of the ore raised in the first six months. Last March the directors paid an interim dividend of 5 per cent. on the entire capital of the company, making, with a previous distribution of 10 per cent. in July of last year, 15 per cent. in respect of the profits of 1894. Though it is impossible for them to fix a date for the next distribution in respect of that year, they hold out promises of a distribution at the earliest moment the resources at their disposal will permit.

DEATH OF SIR JOSEPH PRESTWICH.

The death is announced of Sir Joseph Prestwich, the eminent geologist. The deceased gentleman, who was 80 years of age, was one of the few men who have been able, amid commercial pursuits, to work their way to a very high position in the scientific world. He made geology his favourite study very early in life, his first publication on the subject being a paper on "The Structure of the Neighbourhood of Gomrie, Banffshire, particularly on the Deposit containing Ichthyolites," which was read before the Geological Society in 1835. In later years Sir Joseph chiefly confined his energies to the tertiary and post-tertiary deposits. In 1874 he was elected to the Chair of Geology in the University of Oxford, and Professor Prestwich immediately made himself very popular in the University. He held geological views opposed to those of Sir Charles Lyell, considering that the pupils of the latter had carried "Uniformitarianism" further than their chief had ever intended. But, nevertheless, he was very anxious to point out that the doctrine of non-uniformity must not be confounded with a blind reliance on catastrophes. He held that the laws of chemistry and physics were unchangeable, but that the exhibition of the consequences of those laws in their operation on the earth had been one of constant variation in degree and intensity of action. He argued great interest in the mineral water which was discovered in sinking an artesian well at St. Clements, Oxford, arguing that from the nature of it, in all probability, the coal-bearing rocks might be met with at no great depth in the neighbourhood. When he resigned in 1888, the University, to mark its value of his work, conferred on him the honorary degree of D.C.L. He had been President of the International Congress of Geology, was a Fellow of the Royal Society, a corresponding member of the Académie des Sciences, and an honorary member of a number of several foreign scientific societies.

YALGOO PUBLIC BATTERY.—In cable received from Messrs. F. W. Prell and Co., Melbourne, dated June 25, the manager reports as follows:—"Much pleased with the appearance of your mine; it looks very well. Opened up large body of ore; the reef shows visible gold freely. As far as I can judge the vein improves as it goes down below the water level. The west reef is doing very well. The width of the reef is 5 feet wide at a depth of 21 feet, and as far as can be seen a fine body of ore in payable gold exists."

The directors of E. W. TARRY and Co. (LIMITED) have declared an interim dividend at the rate of 10 per cent. per annum on the ordinary shares of the company, payable on July 4 next to shareholders registered on or before June 30,

THE MINING MARKET.

FRIDAY EVENING.

Midsummer Markets.—The disturbed political outlook upsets South Africans.—Other departments dull and uninteresting.

THE South African Market experienced a regular damper on Saturday morning, in the shape of a fresh crop of political complications, added to some very disturbing news as to the native rising in Rhodesia. With regard to the former factor in the situation, it was so far unexpected by the general run of operators that it completely upset calculations, and in the shortest space of time worked a complete change of front in the disposition of dealers. The big African houses, kept fully posted from the other side as to what had been going on, were probably not so much astonished at the action of the Transvaal Government as their less well-informed neighbours, and it is more than likely that, after the manner of their kind, they had taken time by the forelock, and arranged their affairs for a fall. Certain it is that all the hopelessness seems to have gone out of the market, and though, under the circumstances, prices have kept wonderfully steady, the clatter of the Street has veered round to anticipations of lower prices and further dislocation of business. The customary calling in of balances by bankers and capitalists at the end of the financial year has had its full effect in reducing speculation, and as we are every day getting nearer to the recognised Summer holiday season, it is not to be wondered at that the public, disgusted with their frequent disappointments, are curtailing their commitments and leaving the markets to stagnation. As far as Rhodesian enterprises are concerned, one can hardly blame the cautious man who stands aloof. The alarming news, elaborated as it is by the sensational journalist, is not calculated to set folks buying. The Stock Exchange has just entered upon a nineteen days' account, which is proverbially bad for business, so that taking one consideration with another, there appears to be little practical use in indulging in forecasts of the market until the atmosphere is clearer. The unexpected so frequently happens that it would be foolish to fix a limit for the continuance of the present inactivity. The consensus of opinion, however, is that the Mining Market is in for a dull time.

On Saturday the demand for the inclusion of Mr. Rhodes and Mr. Beit in the Jameson trial was the immediate cause of a general upset in Kaffirs, and although no one imagined that the Home Government would submit to dictation of this kind, the uneasy feeling engendered was undeniably Rhodesian properties particularly suffered, though the fall in gold shares was generally covered by small fraction. Matters were very quiet in the West Australian section and miscellaneous shares were dull. Monday was the last day of the end of June account, and as the preponderance of business was in the nature of clearing out to avoid the carry-over, dealers naturally read everyone a seller, and put down prices in self-defence. Paris was selling conspicuously, and markets were generally flat, though the reductions in price were not serious. Kangaroos were, if anything, a worse market than Kaffirs. New Zealanders were off, and the only steady market was that for Indian Shares. Tuesday was taken up with the carry-over arrangements. Rates were rather stiffer than recently, more particularly in the case of the lower-priced shares. The calling in of bankers' balances was the most plausible explanation of this. The Contangoes on Kaffirs ran from 6 to 9 per cent., and on West Australians from 8 to 10. Chartered opened with a 3d. Contango, which gradually went off, indicating an increase in the account for the fall. In the afternoon some attempt was made to instil fresh life into the market, and prices hardened up, but the better tendency was not long maintained, and Kaffirs were dull again at the close. West Australians kept steady, and firmness was displayed by Indians and New Zealand varieties. On Wednesday a distinctly better tone prevailed for Kaffirs, a stimulus coming in buying orders from Paris, notably for De Beers and East Rands. Several improvements were scored in the West Australian section. Copper shares improved. Indians were well maintained, and there were plenty of buyers for New Zealanders. The better tendency did not continue far into Thursday, so far as Africans were concerned, for after mid-day prices sagged away from sheer lack of support, though in other departments the dulness was not intensified into actual weakness. To-day was Pay Day, and the Settlement was brought to a satisfactory conclusion, but of new business there has been none, and the market, left to its own devices, has further weakened.

South Africans.

Chartered were standing at 3½ when we wrote a week ago, and on Saturday morning they were sold below 3½. On Tuesday they were offered at 2½, the bears at the same time propagating the most pessimistic forecasts of the future of the company. To-night the shares are ½ lower on balance at 3½. Goldfields Deferred have lost half a point at 12½, whilst the Debentures show a rise of nearly three points at 11½. Gold Trusts are ½ down at ½ ex the 7s. 6d. dividend. Gold Fields Deep have stood their ground and close at 11½. Rhodesian properties generally have suffered, as was to be expected. In Rhodesia Exploring at 6½, the fall is a full point. Willoughby Consols at 1½, Mashonaland Agency at 2½, Exploring Land and Minerals at 1½, and Bechuanaland at 1½ are all ½ down. East Rands were specially attacked on Paris account on the eve of the Settlement, for which they were made up at 7½. They rallied over 8 on Wednesday, but have since relapsed to the making up price, which leaves them ½ down on balance. Anglo-French Explorations have lost ½ at 5½ and reductions of ½ are seen in Comets at 3½ and St. Angelo at 5½. Rand Mines have been particularly flat on French sales and finish 2½ down at 30½. Deep Levels are generally lower in sympathy. Nourse Deep being ½ down at 6½, with smaller falls in Consolidated Deep at 6½, Geldenhuys Deep at 6½, and Roodepoort Deep at 2½. The Barnato Group has been fairly well maintained. Banks at 2½ are without change, as are Ginsbergs at 2, Kimberley Roodeport at 2½, and Rietfontein at 3½. Declines ranging up to ½ are shown in Buffels at 2½, Barnato Consols at 3, Glencairn at 3½, Langlaagte Royal at 2½, New Primrose at 5½, and Johannesburg Investment at 3½. Among the Robinson stocks declines of ½ are marked in Randfontein at 2½, and Langlaagte at 5½. The Eckstein group shows signs of the prevailing lack of backbone. Nigels have fallen ½ to 3½, and Modders ½ to 7, whilst losses of ½ appear in Ferreira at 20½, Henry Nourse at 6½, Geldenhuys at 3½, and Wemmers at 9½. Afrikanders have been twisted up to the neighbourhood of 2, at which they show a gain of ½ or so. Knights are well maintained at 7½, and there is no material alteration in Worcester at 4½, Sheba at 2½, Robinson at 9½, Aurora at 1½, Orion at 1½, and Stanhope at 1½. Meyer and Charlton have suffered to the extent

of ½ at 5½, whilst Luipaard's Vlei are exceptionally ½ higher at 2½. Small losses have to be reckoned with by the holders of Bantjes at 3½, Crown Reef at 11½, Durban Roodepoort at 6½ x.d., Steyn Estate at 1½, Tati Concessions at 2, Van Ryn at 4½, Vogelstruis at 4½, and Wolhuter at 7½. The small-priced Lydenburg shares have lost a few pence all round, except Spitzkops, which remain at 1½. A special spurt in De Beers on Wednesday, attributed to Paris buying, leaves those shares ½ better at 3½, but Jagers are ½ easier at 11½. Leicester Diamonds are unchanged at 3½.

West Australians.

The feature of the week has been the strength of the Associated Group on the successful flotation of the second subsidiary company, the Lake View Extended. The shares of the parent company were dealt in over 4 yesterday, and stand tonight at 3½, ex the rights to one share in the new company for every five in the parent. Associated Southerners close below the best at 2. Joint Stock Trusts, which Mr. Bottomley is manipulating with such assiduity, went to 3½ premium, but reacted this afternoon to 3½, which shows a gain of 10s. on the week. Half-a-crown per share dividend is to be paid on July 24. We stated a week ago that the sharp rise in Royal Sovereign was attributable to a corner in the market. The accuracy of this opinion was shown on Account Day when £4 was bid for cash at a time when the shares were offered for next account at 3½. The price to-night is 3½, or ½ lower than last week's. The Great Boulder crushing, 2542 ounces from 694 tons, has not prevented a fall of ½ in the shares to 7½, and declines are the order of the day in the Hannan's Group, a special exception being Paddington Consols, ½ better at 2½. Brownhills close at 6½, Hannan's Proprietary at 2½, Hannan's Reward at 2½, Lady Loch at 3½, Lake View at 7½, and True Blue at 7. The Menzies Group has been fairly well supported, small gains being scored by Florence at 2½, and Lady Shenstone at 3½. West Australian Gold Fields have given way under realisations, and close half a point down at 10. Mainland Consols are rather better at 4, whilst Colonial Finance at 4½, London and Globe, and Exploring and Finance at 3½, Hampton Plains at 4½, and Share Corporation at 1½, are all rather easier. Amongst the shares which are better on balance we find Mawson's Reward at 1½, and Pilbara at 1½. The Ramage Syndicate Group shows a small loss all round.

Miscellaneous.

There has been very little actual business in this division apart from the Indian and New Zealand Sections. Indians, after a fair show of strength, have given way this afternoon, though losses are insignificant. Champion Reefs close at 7½, Mysore at 7½ ex div., Nundydroog at 3½, Oregum at 3½ d., and Wynnaid at 18s. 6d. In the New Zealand Group small reductions are marked in Waahi at 7½, Silverton at 3½, Taipu at 3½, Royal Oak at 4s. 6d., and Kapanga at 17s. Gold-fields have improved ½ to 4½, and Scotty's are better at 5s. There has been nothing doing in Charters Towers varieties. Broken Hill Props. are maintained at 2½, but British have lost ½ at 1½. Mount Lyells are ½ down at 7½ and Mount Morgans ½ easier at 3½. Wentworths are rather easier at 1. Some attention has been directed to the shares of the Mines Contract Company, in which business has been done round about 1½. The company has paid recent dividends amounting to 2½ per cent., and has a substantial cash reserve. The directors have in contemplation an important flotation in connection with a concession in the Ural Mountains. Copper shares have been active, though the tendency of prices has been downwards. Rio Tinto have lost ½ at 24½, Anaconda ½ at 7½, and Tharsis ½ at 6.

STOCK EXCHANGE SETTLING DAYS.

CONSOLS.

Wednesday, July 1.

MINING MAKING-UP DAYS:

Saturday, July 11. | Monday, July 27.

MINING NAME DAYS:

Monday, July 13. | Tuesday, July 28.

ACCOUNT DAYS:

Wednesday, July 15. | Thursday, July 30.

MINING IN THE NORTHERN DISTRICT.—Mr. Thomas Bell, in his annual report as Chief Inspector of Mines and Quarries for the Durham district, notes that while the number of persons employed in and about coal and ironstone mines, 79,492 at the end of 1895, was larger by 411 than a year earlier, there had been a smaller output in the 12 months, and a smaller number of days worked, than in 1894. The output of coal, 27,525,371 tons, was less by 950,727 tons; and the days worked in producing it were fewer by 2013. It amounted to 303 tons only per person employed. For every 292,628 tons raised, there was a death from accident, so that one worker in 965 lost his life during the year. By explosions there were only six persons injured; but 190 were injured and 40 killed by falls of roof and side. Falls, indeed, accounted for 54 per cent. of all underground deaths. The fault of their occurrence is imputed in all but a few cases to the management. Mr. Bell says:—"It is highly desirable, in my opinion, to introduce a special rule requiring the manager to stipulate a distance within which timber should be set in the different working places under his charge. Some of the managers in this district do this, and the result is that a fatal accident from falls very seldom occurs at the collieries where this provision is in force, and there have been cases where a man has been slightly injured who, but for the timber being set at a specified distance from the face, would undoubtedly have lost his life. I cannot too strongly call the serious attention of managers and other officials, as well as workmen, to this most important matter." It would seem to be the lack of rules which is entirely to blame, for there were no prosecutions during the year of either owners, agents, or managers. Under the Metalliferous Mines Act there is not much to be said. Metalliferous mining is fast dying out in this district. The mines at work, the persons employed, and the mineral produced are only about one-third of what they were 25 years ago; and if it were not for the rougher material wrought, such as slate, stone, clay, iron ore barytes, &c., such mines might be said to be practically closed. Their total output in the year was 122,458 tons, of which 78,030 tons was stone. With regard to the Quarries Act of 1894, however, Mr. Bell finds occasion to publish important figures. He writes:—"From returns I have received, I find there are 330 quarries in this district which exceed 20 feet in depth, employing 3206 people, and which come under the provisions of the Act; while there are 354 quarries, employing over 802 people, and are under 20 feet in depth, and consequently do not come under the Act. It, therefore, appears that there are about one-half of the quarries in this district, working daily, which are not subject to any supervision whatever. The majority of these quarries are running the same risks as the others, as various kinds of explosives are used in them." But in the quarries under inspection there were but six fatal accidents, and 31 non-fatal. Mr. Bell has drawn up and circulated among them a set of comprehensive rules for working.

We are informed that the first batch of letters of allotment in the Almaraz Tin Mining and Smelting Company (Limited) have been posted.

THE METAL MARKETS.

THE METAL MARKET, LONDON, JUNE 26.

Copper.

THE American market continues steady with Lake quoted at 11½ cents per pound, whilst shipments and offers thence continue on a moderate scale, the former having been 2054 tons for last week. European consumers are only taking moderate quantities, so that the tendency of prices of refined copper is rather in favour of buyers. The position of manufactured remains exactly as last week—i.e., with "strong" sheets in moderate demand, but without business in India sheets (copper) and G.M. squares, £33 to £35 6s. for tough qualities, and £35 10s. to £35 15s. for B.M.G.'s qualities. The speculative market has always been quiet, and those who were of late the leading purchasers have only operated during the present week on a moderate scale, opening at £30 1s. 6d. three months, touched £30 6s. on Monday, and then declined to £29 11s. 3d. three months, and £19 7s. 6d. s.c. The daily business is summarised below:—

S.C.	Three months.	P.T.
Monday..... £30 1s. 6d. down to £19 12s. 6d.	£33 2/6, 5d. down to £19 12s. 6d.	1200
Tuesday ...	£19 10s. 8/9	£30, £29 6s., £19 5s., 6/3, 8/9,
Wednesday	£19 17s. 16/3	1½, 11/3, 10/
Thursday ...	£19 15/5	£29 17/8, 15/9, 45/6, £19 17/8,
Friday.....	£19 8s. 7/6, 8/9, 10/	£29 16/3, 13/3, 15/
		800
	Total	£19 12s. 6d. buyers of three months.

The close is strong at £43 16s. 3d. sellers of s.c., and £19 17s. 6d. buyers of three months.

Tin

was quiet on Monday and Tuesday at £31 2s. 8d. to £30 15s. s.c., and £19 17s. 6d. to £31 7s. 6d. three months, but Wednesday and Thursday were distinguished by considerable activity and greater firmness, values improving to £31 10s. and £31 three months, but closing slightly below the best. The daily transactions are summarised below:—

S.C.	Three months.	P.T.
Monday..... £31 2/6	... £31 17/6, £31 16/3, £31 10/ ... 125	
Tuesday..... £30 17/6, £30 15/6, £31, £31 2/6 £31 10/6, £31 7/6, £31 10/ ... 150	
Wednesday	£31 6/3	... £31 15/6, £31 16/3 ... 150
Thursday ...	£31 10/	... £32 1/3, £32, £31 17/6 ... 200
Friday.....	£31 6/3	... £31 17/6, £31 16/3 ... 200
	Total	1125

The market closes quiet at £31 5s. to £31 6s. 3d. s.c., and £31 15s. 3d. to £31 17s. 6d. three months, with Australian at about 25s. per ton premium. English tin is quoted at £35 10s. for ordinary ingots, £36 10s. for bars, and £37 10s. for refined ingots. Billiton opened at fl. 35 4s. s.c., declined fl. 36s., but rallied to fl. 36 ½s. at the close. Three months' Billiton is at fl. 36 ½s., and spot Bars at fl. 37 ½s.

Lead

is somewhat dearer, with more demand on the part of consumers. We close at £11 1s. 3d. soft foreign, and £11 5s. to £11 7s. 6d. English.

Spelter

is a little easier, but only moderate quantities are obtainable, especially for early delivery. The closing quotations are £13 5s. to £13 7s. 6d. for ordinary, and £18 7s. 6d. to £18 12s. 6d. for specials.

Pig Iron

Last week's shipments from Scotland were 5565 tons, or 1208 tons over those of the corresponding period of last year. The Glasgow market opened steady at 45s. 2d., touched 46s. 2½d., and then declined to 45s. 11½d., recovering immediately afterwards to 46s. 2½d., and closing steady at 45s. 2d. s.c., and 46s. 4½d. a month buyers. Hematite and Middlesbrough close respectively at 47s. 1½d. and 37s. 2d.

Antimony

remains very quiet, and closes steady at £30 to £30 10s.

Quicksilver

is likewise steady at £5 10s. firsts, and £5 9s. seconds.

Silver

opened unchanged at 31½s. standard, rose on Wednesday to 31¾s., and Thursday to 31½s. closing therest.

COMPANY FINANCE.

Reports, Balance Sheets, Dividends, &c., of Mining and other Companies.

PLAYA DE ORO MINING COMPANY.

Messrs. Maguire, Baucus, and Stapleton, the London representatives of the Playa de Oro Mining Company, have received an official statement from the head office in New York, announcing that sufficient of the Treasury shares have been sold to ensure the completion of the hydraulic plant of the company now in partial operation. The company has, therefore, withdrawn the balance of its treasury shares from the market. The hydraulic plant referred to, which is now in operation with a supply of only from 700 to 1000 miners' inches, will furnish, when completed, a permanent water supply of from 10,000 to 20,000 miners' inches per day. This supply of water will enable the company to wash from 50,000 to 100,000 cubic yards of gravel per day, which at the present average should yield gold bullion to the value of from £2000 to £4000 each 24 hours at a cost of from £300 to £600. This hydraulic plant should be completed and in full operation in about a year, and will be by far the largest plant of its kind in the world. The gold-bearing banks belonging to the company extend for several miles along both sides of the Santiago River, and the washing of gold will be conducted at various suitable points along the entire extent of these banks.

THE RAND CENTRAL ELECTRIC WORKS (LIMITED).

The directors inform us that, notwithstanding the recent troubles in the South African Republic, they still expect the works to be ready for the supply of electric power by the beginning of November next, as stated in the circular letter of March 19 last. The last shipments of plant and materials necessary for the completion of the main line and installations are being rapidly pushed forward by the contractors, Messrs. Siemens and Halske. To meet further payments which will become due to that firm, the final call of 5s. per share has been decided upon, of which formal notice is enclosed herewith. By a resolution of the board a general meeting of the company will be held in September next, when the latest information in the possession of the directors will be furnished to the shareholders. Due notice will be issued as to the date and business of the general meeting.

THE LONDON AND WESTERN AUSTR

"THE MINING JOURNAL" SHARE LIST.

ABREVIATIONS AND REFERENCES.—The following are the significations of the abbreviations and references which occur in the Share List:—*Ay.*, Antimony; *A.*, Arsenic; *B.*, Blende; *Bx.*, Borax; *C.*, Copper; *D.*, Diamond; *G.*, Gold; *I.*, Iron; *L.*, Lead; *M.*, Muriate; *N.*, Nitrates; *P.*, Phosphates; *Q.*, Quicksilver; *R.*, Ruby; *S.*, Silver; *S.I.*, Silver-lead; *Sul.*, Sulphur; *T.*, Tin; and *Z.*, Zinc. * In the "Amount of Share" column of British Mines signifies that the mine is conducted on "Cost Book" principles; † in the "Head Office" column of African Mines signifies that the address given is not that of the head office but of a sub, or transfer office; and ‡, following the names of African Mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

* The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time as occasion requires. Every effort is made to ensure accuracy, and Secretaries of Companies, Share Dealers, and our readers generally, are cordially invited to co-operate with us to this end, by notifying us of any errors that may at any time occur. We desire it to be understood that, while our Share List will almost invariably be found correct, we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

AFRICAN MINES.

Name.	Closing Price, June 19, 1896.	Closing Price, June 19, 1896.	Am't. of Share.	When last XD and Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
Abbott's Con. Beefs	6/- 7/-	6/- 7/-	1/- C	—	1/- 8/-	250,000	De Kasp	Broad Street Avenue
Alder Consolidated	13/- 15/-	13/- 15/-	1/- C	2/- & rts Oct. 18 '95	1/- 0/-	438,000	—	1, Moorgate place.
African Estates.....	29/18 21/18	21/18 21/18	1/- C	rts Oct. 30 '95	1/- 0/-	175,000	—	2, Copthall-buildings.
" Gold Envry.	13/- 15/-	13/- 15/-	1/- C	—	1/- 0/-	1,750,000	—	3, College Hill.
Africana.....	9/- 10/-	10/- 11/-	1/- C	rts May 24 '95	1/- 0/-	40,000	Transvaal.	4, Clement's lane
Africander.....	13/- 15/-	13/- 15/-	1/- C	—	1/- 0/-	225,000	Rand.	5, George street
Alexandra Estate G	2/18 1/18	2/18 1/18	1/- C	7/ May 29 '95	1/- 0/-	30,000	Rand.	6, Princes street
Anglo-Sw. French Exp.	5/5 5/5	5/5 5/5	5/- C	—	1/- 0/-	30,750	Matabal.	7, Dashwood House.
" Matabelrand	2/18 3/18	3/18 3/18	1/- C	—	1/- 0/-	77,185	West Cost	8, Old Jewry.
Appontoo.....G	13/- 15/-	13/- 15/-	1/- C	—	1/- 0/-	65,000	Rand.	9, Lothbury.
Aurora.....G	13/- 15/-	13/- 15/-	1/- C	5% Mar. '93	1/- 0/-	100,000	—	10, Bishopsgate-st., W.
" West United.	13/- 15/-	13/- 15/-	1/- C	3/- Dec. 16 '95	1/- 0/-	250,000	Toke, Ho., Cophill-Av	11, Old Jewry.
Austral-African ..	7/- 8/-	11/18 12/18	1/- C	—	1/- 0/-	—	—	12, Queen-street-place
Balkis Eersteling G	2/9 3/3	3/3 3/6	1/- C	—	0 10 0	520,000	Transvaal.	13, Gracechurch-st.
" Land.....	6/6 7/-	7/3 7/8	10/-	1/ Feb. 13, '96	0 10 0	520,000	—	14, Ge. st., Mn Ho.
Fantais Consol...G	3/3 4/-	4/5 4/5	1/- C	rts Sep 24 '95	0 10 0	83,000	—	15, St. Swithin's-lane
Barnato Bank.....	2/18 2/18	2/18 2/18	1/- C	—	1/- 0/-	2,250,000	—	16, Lothbury.
" Consol....	1/18 3/18	3/18 3/18	1/- C	—	1/- 0/-	1,000,000	—	17, Basinghall-street
Barrett.....G	16/- 17/-	16/- 17/-	10/-	—	0 10 0	407,000	De Kaap	18, St. Swithin's-lane
Bechuanaland Exp.	1/5 1/5	1/5 1/5	1/- C	rts Jy 24 '95	0 10 0	400,000	Bechuanana.	19, St. Swithin's-lane
" Tradg A. & Co.	1/4 1/4	1/4 1/4	1/- C	5 pc Jan 16, '96	0 10 0	100,000	—	20, Basinghall street
Big Golden Quarry	1/6 1/6	1/6 1/6	5/-	—	0 5 0	482,226	Kaap Mvr.	21, Broad-street.
Block "B" Lang.	13/- 15/-	13/- 15/-	1/- C	—	0 10 0	535,000	Rand.	22, Prince's-st., E.C.
Bonanza.....	1/5 1/5	1/5 1/5	1/- C	—	0 10 0	2,010	Turfontu	23, Bishopsgate-st.
Brit. S. A. Char. ..	3/18 3/18	3/18 3/18	1/- C	rts Jy 26 '95	0 10 0	999,750	S. Africa	24, Swithin's-lane
Buffelsdorn.....G	2/18 2/18	2/18 2/18	3/- C	16/- Nov. 28 '95	0 10 0	250,000	Potchefstr	25, Old Jewry.
" Central.....	2/18 2/18	2/18 2/18	3/- C	—	0 10 0	—	26, Old Jewry.	
" Consolidated	3/4 3/4	3/4 3/4	1/- C	—	0 10 0	225,000	—	27, Basinghall street
Cape Asbestos.....	3/- 1/-	3/- 1/-	1/- C	—	0 10 0	50,311	Warnford Court.	28, Bank Buildings
" Copper.....C	2/9 2/9	2/9 2/9	2/- C	2/ June 12, '96	0 10 0	300,000	Potchefstr.	29, Bury-st., E.C.
" 5% Prefs..	3/9 3/9	3/9 3/9	1/- C	2/ June 12, '96	0 10 0	45,000	Prince's Estate G	30, Coruhill, E.C.
Cassel Coal.....	11/18 1/18	1/18 1/18	1/- C	1/5 Apr. 29 '96	0 10 0	75,000	Rand Central Ore	31, Bank Buildings
Cen. de Kasp.....	1/9 1/9	1/9 1/9	5/-	—	0 10 0	100,000	Rand.	32, Coruhill, E.C.
" Hoop's Deep	2/18 2/18	2/18 2/18	1/- C	—	0 10 0	240,000	Rand.	33, Coruhill, E.C.
Champ d'Or.....G	2/- 2/-	2/18 2/18	1/- C	3/2 Feb. 27 '96	1 0 0	116,018	Rand.	34, Prince's-st., E.C.
Chaterland G.F.	3/6 3/6	3/6 3/6	1/- C	—	1 0 0	150,000	Rand.	35, Prince's-st., E.C.
Chimes West.....	3/18 3/18	3/18 3/18	1/- C	—	1 0 0	150,000	Rand.	36, Prince's-st., E.C.
City and Sub.N.W.G	4/5 5/-	4/5 5/-	4/- C	10/- June '95	0 10 0	340,000	Rand.	37, Prince's-st., E.C.
Con. Bulfontein D	3/3 3/4	3/3 3/4	3/- C	1/9 Jan. 18 '96	0 10 0	721,500	Rand.	38, Prince's-st., E.C.
Con. Deep Levels G	5/5 5/5	5/5 5/5	6/- C	4/- July 11 '95	0 10 0	187,250	Rand.	39, Prince's-st., E.C.
Con. G. Fields B.A.	12/18 13/18	13/18 13/18	1/- C	10/- May 19 '96	0 10 0	250,000	Rand.	40, Prince's-st., E.C.
Do. 5% Prefs.....	11/18 2/18	2/18 2/18	6/- C	7/5-Jd. Oct. 25 '96	0 10 0	1,243,929	Rand.	41, Prince's-st., E.C.
Do. 5% Z. Deben.....	11/18 12/18	12/18 12/18	1/- C	2/ June 27 '95	0 10 0	60,000	Rand.	42, Prince's-st., E.C.
Crown Deep.....G	12/- 13/-	11/16 12/16	1/- C	—	1 0 0	250,000	Rand.	43, Prince's-st., E.C.
" Keet.....G	11/16 11/16	11/16 11/16	1/- C	1/- Apr. 29 '96	1 0 0	120,000	Rand.	44, Prince's-st., E.C.
De Beers Consol. D	31/- 31/-	30/5 30/5	20/- C	15/- Jan. 16 '96	0 8 0	789,751	Kimberly	45, Lombard-st.
Do. 5% 1st Deb.	10/9 11/9	11/9 11/9	10/-	5/2% Jan. 26 '96	0 8 0	23,500,000	—	46, Lombard-st.
Do. 5% Z. Bul. Ob.	105 105	105 105	107/-	5/2% Oct. 28 '95	0 8 0	720,000	Doornkop	47, Lombard-st.
Doorstop.....	5/- 6/-	5/- 6/-	6/- C	—	1 0 0	250,000	Warnford Court	48, Old Jewry.
Driefontein.....	3/- 3/-	3/- 3/-	3/- C	—	1 0 0	175,000	Winchester Ho.	49, Cannon-street.
Durban Roodept. G	5/- 7/-	7/- 7/-	7/- C	3/- June 26 '95	1 0 0	125,000	Rand.	50, Cannon-street.
" Deep.....	4/- 4/-	4/- 4/-	4/- C	—	1 0 0	—	51, Old Jewry.	
Eastleigh.....G	1 1/8 13/8	13/8 15/8	1/- C	rts May 14 '96	1 0 0	240,000	Klerksdrp	52, Leadenhall Street
East Orion.....	5/5 5/5	5/5 5/5	5/- C	—	1 0 0	275,000	Rand.	53, Old Jewry.
Exploration.....G	7/18 7/18	7/18 7/18	8/- C	5/- Mar. 12 '96	1 0 0	570,000	—	54, St. Swithin's-lane
Exploring L & M...	1 1/8 1 1/8	1 1/8 1 1/8	1 1/8 C	2/ Dec. 16, '95	1 0 0	148,000	St. Angelo	55, Old Jewry.
Farreira.....G	20/16 21/16	21/16 21/16	1/- C	10/- Mar. 12 '96	1 0 0	45,000	Palmerston Ridge	56, Old Jewry.
French Rand.....	3/4 3/4	3/4 3/4	3/- C	—	1 0 0	480,000	Transvaal.	57, Old Jewry.
Goldenhuis Deep G	6/- 6/-	6/- 6/-	5/- C	—	1 0 0	265,000	Roodepoort Deep	58, Old Jewry.
Giedenhuus Est. G	3/6 3/6	3/6 3/6	4/- C	6/- Jy 26 '95	1 0 0	187,500	Roodepoort U.S.	59, Old Jewry.
Main Ref. Main Est. G	11/18 11/18	11/18 11/18	1/- C	2/ Feb. 13 '96	1 0 0	400,000	Rotheys Deep	60, Old Jewry.
George Goch.....G	2/9 2/9	2/9 2/9	2/9 2/9	1/- C	0 10 0	400,000	St. Angelo	61, Old Jewry.
Ginsberg New.....G	1 1/8 2/18	2/18 2/18	1 1/8 C	1/2 Feb. 13 '96	0 10 0	130,000	South West Rand	62, Old Jewry.
Glencairn.....G	3/4 3/4	3/4 3/4	3/4 3/4	1/- C	0 10 0	200,000	Spitzkops (New) G	63, Old Jewry.
Golden Dove.....	1/3 2/-	1/3 2/-	1/3 2/-	1/- C	0 10 0	60,000	S. Africa	64, Old Jewry.
Gld. Fls. Deep...G	11/- 11/-	11/16 11/16	1/- C	—	1 0 0	600,000	Tati Concessions	65, Old Jewry.
G. F. of Lydenb'r'g	3/4 3/4	3/18 3/18	1/- C	—	1 0 0	270,000	Transvaal.	66, Old Jewry.
G. F. of Mashond.	3/4 3/4	3/4 3/4	1/- C	—	1 0 0	50,000	Trans. Coal Trust	67, Old Jewry.

"THE MINING JOURNAL" SHARE LIST—(Continued)

AUSTRALIAN AND NEW ZEALAND MINES.

Name.	Closing Price, June 26, 1896	Closing Price, June 19, 1896.	Am't. of Share	When last XD and Dividend.	Called up per Share	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Achilles Gold Fld.	7/8 3/	2/9 3/3	2/5	—	0 2 8	62,458	Otago, N.Z.	11, Poultry, L'Kn'N.B.W.
Alddins Lamp G	1 1/2 2	1 1/2 1/2	1 0	1/ May, 14 '96	1 0 0	100,000	—	4-6, Throg. Avenue.
Anglo-Con. G. Syn	2 1/2 2 1/2	2 1/2 2 1/2	1 0	100 2 '95	1 0 0	99,000	—	22, Austin Friars.
" Founders..	55 45	55 45	1 0	4/18/2-5/2 '95	1 0 0	1,000	—	79, Queen Street.
" French Exp	1 1/2 5/	1 1/2 1/2	1 0	5/- Oct. 30 '95	0 10 0	40,000	W. Austral	4, Gt. Winchester St.
" Ger. Explor.	1 1/2 5/	1 1/2 1/2	1 0	5/ Oct. 20 '95	0 10 0	50,000	—	42, New Broad-street.
Arrow Brownhill G	5/ 5	5/ 5	1 0	—	1 0 0	80,000	—	22, St. Swithin's-in
Assoc. Gold Mines	3 1/2 3 1/2	3 1/2 3 1/2	1 0	rts June 28 '96	1 0 0	375,000	Gool, "W.A.	4, Gt. Winchster St.
Australasian...G	3 1/2 4/	3 1/2 4/	1 0	-/8 Mar., '96	1 0 0	10,000	20, Bucklersbury	20, Bucklersbury
Australian...C	—	—	1 0	-/9 Aug. '95	7 7 8	218,315	5, Queen-st. place	42, New Broad-street.
Aus. Bro. Hill Con.	-/9 1/3	/9 1/3	1 0	1/- June, '91	1 0 0	22,708	Winchester House.	33, Cannon-street.
Baker's Creek...G	5/ 5	5/ 5	1 0	1/- May '95	0 17 6	50,000	H'gve NSW	4, Gt. Winchster St.
Bayley's Reward G	4/ 5/	4/ 5/	1 0	-/4 Dec. '94	1 0 0	450,000	Coolgardie	28, St. Swithin's-in
Big BlowG	5/ 5	5/ 5	1 0	—	1 0 0	150,000	—	15, Cannon Street.
Black Flag Consol'd.	1 1/2 3/2	1 1/2 1/2	1 0	—	1 0 0	140,000	W. Austral	4, Bishopsgate St. Wn
" Prop'ty	5/ 5	5/ 5	1 0	—	1 0 0	60,000	Coolgardie	1, Metal Exch. Blids
Blagroves Freshld	4/ 4/5	4/ 4/5	2/5	—	0 2 6	200,000	Cerom, N.Z.	Dashwood House.
Bonnie Dundee G	8/ 8/	7/ 7/	1 0	—	0 18 6	120,000	C. T. Q'ian:	18, Helen's Place
Brilliant.....G	1 1/2 1/2	1 1/2 1/2	2 0	-/5 May 29 '96	2 0 0	250,000	—	18, Helen's Place
" Block.....G	1 1/2 1/2	1 1/2 1/2	1 0	-/6 Dec. 16 '95	1 0 0	70,000	—	18, Helen's Place
" Ste.Geo.G	1 1/2 1/2	1 1/2 1/2	1 0	-/8 June 8 '96	0 10 0	70,000	—	Charters Towers.
Brit. Brok. Hill S	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	240,000	N.S. Wales	—
Broad Arrow ...	2/9 3/3	2/9 3/3	5/	—	0 4 6	100,000	W. Feathe	4, Gt. Winchester st.
Broken Hill Prop.S	2 1/2 2 1/2	2 1/2 2 1/2	8/	-/1 May 29 '96	0 8 0	980,000	N.S. Wales	3, Gt. Winchester st.
Brownhill Prop'ty	5/ 5	5/ 5	1 0	—	1 0 0	125,000	—	4, Gt. Winchster at
Burbank's Birth'dy	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	150,000	Coolgardie	Coppthall House.
Cassidy HillG	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	115,000	—	9,10, King Street, E.
Central Bound'ys	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	93,522	W. Austral	Wor'st' Ho., Waib'r k
" Exp. & Invst.	1 1/2 1/2	1 1/2 1/2	1 0	1/8 Mar. 11 '96	1 0 0	122,000	W. Austral	1, Met. Exch. Blids
" " of W.A.	1 1/2 1/2	1 1/2 1/2	1 0	1/7 Mar. 27 '96	1 0 0	—	2,	
Charters Tow.G	1/9 2/3	1/9 2/3	10/	—	0 9 8	200,000	Queensinc	110, Cannon Street
Consolid....G	1/9 1/3	1/9 1/3	10/	—	0 9 6	300,000	W. Austral	130, Cannon Street
Colonial Finance...	4 1/2 4 1/2	4 1/2 4 1/2	5/	-/1 Mar. 27 '95	0 10 0	21,140	W. Austral	139, Cannon Street
Gold Fields	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	125,000	—	70, Cornhill.
Con. G. M. of W. A.	3/ 3	3/ 3	1/9 1/2	10/	1 0 0	246,779	Pilbara ..	30, Moorgate Street.
Murchison ...	3/ 3	3/ 3	1 0	—	1 0 0	225,533	Murc., W.J.	Broad Street House.
Contl. & W.A. Trust	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	104,457	W. Austral	Broad Street House.
Coolgardie Gold ...	1 1/2 1/2	1 1/2 1/2	10/	rts Jun 12 '96	0 5 0	90,000	Coolgardie	Broad Street Avenue.
" Mint & L.K.F.	2 1/2 2 1/2	2 1/2 2 1/2	1 0	—	1 0 0	150,000	—	30, S. Swithin's-in.
Craven' Cal.G	1 1/2 2/8	1 1/2 2/8	4/	-/3 June 94	0 4 8	100,000	Queensinc	30-1, S. Swithin's-le.
Crosses Co. United	1 1/2 2/	2 1/2 2 1/2	—	—	1 0 0	115,000	Hann's WA	Biomfield House.
Crown United....	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	75,000	—	110, Cannon-st. E.C.
Cumbria (New)G	1/9 1/2	1/9 1/2	10/	rts Jun 12 '96	0 19 6	184,290	Quesnain:	110, Cannon-st. E.C.
Day Dawn B.W.G	13/13 13/13	13/13 13/13	1 0	-/8 June 12 '96	1 0 0	492,400	—	110, Cannon Street
E. O. G	2/9 3/3	3/9 4/3	1 0	-/8 Apr. '92	1 0 0	490,000	—	110, Cannon Street
Eaglehawk.....G	1/ 1/	1/ 1/	1 0	—	0 18 0	120,000	Victoria ..	71-72, King Wm. St.
Eagle's Nest.....G	7/ 1	7/ 1	1 0	—	1 0 0	3,500	Mt. Margr:	Finsbury House.
Explorers Synd. ...	5/ 5 1/2pm	5/ 5 1/2pm	1 0	2/8 April 29 '96	1 0 0	9,000	W. Austral	Coppthall House.
Fingall Mts. Ext'd	8/6 11/12	8/6 11/12	1 0	1/4 Jan. 10 '96	1 0 0	150,000	—	4, Sun Court
Florrence.....G	2/5 2/5	2/5 2/5	1 0	—	1 0 0	50,000	—	12, St. Swithin's-in
Gibraltar Cons....G	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	300,000	N.S. Wales	43, Threadneedle st.
Gladiotor.....G	1/6 1/2	1/6 1/2	1 0	—	1 0 0	225,000	W. Austral	3-2, Queen-st. E.C.
Glenrock.....G	1/6 2/	1/6 2/	1 0	—	1 0 0	—	—	
Golden Cement G	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	175,000	W. Austral	54 Old Broad Street.
" " Gtn...G	2 1/2 2/	2 1/2 2/	1 0	—	1 0 0	100,000	—	54 Old Broad Street.
" " Hse Shoe...G	1/6 1/2	1/6 1/2	10/	—	1 0 0	150,000	Queensinc	34-36, Gresham-st.
" " Link.....G	2 1/2 2/	2 1/2 2/	1 0	—	1 0 0	90,000	W. Austral	31, Heisen's Place.
" " Plum.....G	1 1/2 1/2	1 1/2 1/2	1 0	-/5 Oct. 30 '95	1 0 0	120,000	—	9,10, King Street, E.C.
Gold Estates.....G	1 1/2 1/2	1 1/2 1/2	1 0	rts June 12 '96	1 0 0	80,000	Tylgarn ..	10, Bishopsgate St.
Great Boulder G	7/ 7/	8 8/	all	1/4 Arts Jn. 12, '96	1 0 0	240,000	—	10, Bishopsgate St.
" Junction	1 1/2 1/2	1 1/2 1/2	10/	—	1 0 0	240,000	—	10, Gracechurch St.
" M'n E's	1 1/2 1/2	1 1/2 1/2	1 0	—	1 0 0	175,000	Kurnalpi ..	12, Prince's Street.
" Fingall Mts.	1 1/2 1/2	1 1/2 1/2	1 0	5/7 Jan. 16, '96	1 0 0	50,000	W. Austral	13-14, Abchurch Ln.
Gresham Synd. ...	5/ 5 1/2pm	5/ 5 1/2pm	1 0	-/4 &bo. Jun 12 '96	1 0 0	—	—	15, Abchurch Lane.
Hainault	3/ 3 3/	3/ 3 3/	—	—	0 10 0	—	—	22, Gordon st., Glas.
Hampshire Gold Flds	1 1/2 1/2	1 1/2 1/2	1 0	—	0 10 0	—	—	22, Mildred's Ct.
" Gold Hill	1/6 1/2	1/6 1/2	1 0	—	0 10 0	300,000	Coolgardie	53-54, Gracechurch St.
" PlainsEx	4 1/2 5/	5 1/2 6/	1 0	rts May 14 '96	0 10 0	180,000	W. Austral	18, S. Swithin's lane
Hannan's Brwn Hil	7/6 8/	7/6 8/	10/	—	0 10 0	85,000	—	20, Broad Street.
Main Dev'lmt	1 1/2 1/2	1 1/2 1/2	1 0	—	0 10 0	147,000	—	22, Broad Street.
Main Ref..	10/6 11/6	10/6 11/6	10/	—	0 10 0	51,107	Kalg.W.A.	32, Broad Street.
North.....	1 1/2 1/2	1 1/2 1/2	1 0	—	0 10 0	—	—	33, Cornhill.
100 Acre.....	1 1/2 1/2	1 1/2 1/2	1 0	—	0 10 0	—	—	20, Broad Street.
Orooya.....G	1 1/2 1/2	1 1/2 1/2	1 0	—	0 10 0	—	—	22, Broad Street.
Rop'p.....G	3/ 3 3/	3/ 3 3/	1 0	—	0 10 0	—	—	22, Broad Street.
Reward.....G	3/ 3 3/	3/ 3 3/	1 0					

LATEST FROM THE MINES.

CABLEGRAMS AND TELEGRAMS.

ANGLO-MEXICAN MINING.—The following is the total mine output for the month of May:—\$41,000 bullion; \$2500 concentrates; 1100 tons; 20 days run.

AROHA GOLD MINES.—The New Zealand Exploration Company (Limited), as agents of above, have received the following cablegram from their manager in New Zealand:—“The Vulcan claim upper level north drive has been pushed 126 feet, and 22 assays have been made, averaging £1 1s. 3d. per ton. Upper level south drive pushed 63 feet; assays average 19s. 9d. Premier winze driven 84 feet; 22 assays average £2 6s. per ton. Mine looking very well.”

ARMADALE.—The undermentioned cablegram has been received from Mr. Frank Nicolas:—“Incline shaft. The lode has been proved to a depth of 140 feet. A great change in the dip of the lode, the vein is nearly vertical, principal part of the gold is in the pyrites.”

BLOCK 50 HAMPTON PLAINS ESTATE.—Copy of cablegram received on June 26, from the manager of Block 50 Hampton Plains Estate, Mr. E. H. Liveing, A.R.S.M., M.N.E.I.M.E., who has just arrived on the property:—“From what I have seen, my impression is favourable. The reports are not exaggerated.—Liveing.”

BRITISH COOLGARDIE.—Cablegram from Mr. W. H. Trewartha James, the company's representative at Coolgardie, June 24:—“Very glad to receive news that Island Queen crushed 3 tons, yielding 444 ounces.”

CARRINGTON.—The following cable has been received:—“Have crushed during the week 8 tons, yielding 18 dwts. per ton. Prospects are encouraging. The average width of the vein is 8 inches. Rich stone has also been found 30 feet from our northern boundary, and the Victoria Company will allow us to take out a crushing when it reaches our property.”

CHAMPION REEF (Nannine, W.A.).—Translation of cable from the general manager, dated Nannine, June 22:—“North outcrop opened up large body of ore of high grade; main shaft is down 101 feet 8 inches; total shafts 600 feet; total drives 450 feet; average width of lode is approximately 10 feet; number of tons of ore on the dumps is 2000; the reserve of ore awaiting stoping 20,000 tons; ore in sight in mine 45,000 tons. I estimate we shall make a profit of £2 per ton net. Machinery arriving slowly.”

CROWN UNITED.—The directors have received the following cablegram from their engineers, Messrs. Cooper and Woodhouse:—“Making all possible progress. Expect to commence crashing middle of next month. Framework of battery erected. Boiler has been erected. Mine is now in a condition to give a constant supply of ore.”

CENTRAL CHILI COPPER (Panuco).—The directors have received from their manager at Panuco by cable:—“Result of work for month of May. Mines produced, 1450 tons; ores bought, 1000 tons; ores smelted, 2350 tons; regulus produced, 293 tons; net profit for the month, £1250.”

COLUMBIA (Charters Towers).—The following cablegram has been received from Messrs. E. D. Miles and Co., the company's managers at Charters Towers:—“Struck seam of formation. Have cut vein 9 inches; heavy material.”

CLUTHA (Barberton, Transvaal).—The latest reports from the mine manager state:—200 feet level. The face is looking well, and the pannings are distinctly encouraging, ranging from 3 dwts. to 1½ ounces.—100 feet level west. Forebreast looks very promising, and we expect to get an increase of gold soon.

EAST RAND.—The following cablegram has been received from Johannesburg:—“Have reached the coal in the shaft.”

ECLIPSE REPUBLIC (Cue).—Report from manager, dated June 23:—“Eclipse. The width of the lode is 5 feet, carrying good gold.—Republic. The width of the lode is 4 feet, and is improving.”

GOLDEN SPUR.—The secretary has received the following cablegram from the mines manager at Hobart, dated June 20:—“Shares here at £ premium. Shaft 487 feet deep. Drift is showing signs of getting into very promising quartz at the 400 feet level.”

GRASKOP.—A cable received from the manager states that he has struck a reef 1 foot thick, yielding 10 dwts. to the ton.

GULLEWA.—Cable from Melbourne agents states:—“Mines are looking well all round. Byrne's Reward, Gullewa King, and Christmas Gift claim, the reefs show visible and very good gold freely.”

HANNAN'S KING (Brownhill).—The following mail report has been received from the mine manager on the property at Kalgoorlie:—“No. 2 shaft. Have sunk this shaft to 35 feet. The quartz leader mentioned in my last report is of very large formation and has widened considerably, carrying good gold. Have selected two parcels of this stone for assaying, and will send result in next report.”

HARQUAHALA.—Cabled result of tailings treated at Harquahala (Arizona) for the month of May:—“3830 tons of tailings treated; bullion yielded, \$9279; expenses on revenue account, \$5737; profit for month, \$3542 (at \$4.90 to £ sterling, £723.)”

HANNAN'S BROWNHILL.—The following cable has been received from the mine:—“Connecting levels Nos. 2 and 3 by a winze.—Winze No. 6, 250 feet to the south of shaft have struck very rich ore at a depth of 38 feet.”

HAURAKI (N.Z.) ASSOCIATED.—Cable received from the company's local committee, Auckland:—“Have now eight men employed on Rainbow lode; have followed the ore down by a winze for 55 feet. The country looks exceedingly well for gold. From the stopes above level picked specimens (the) last time (of) breakdown. The lode in face of drive is well-defined and of a promising nature, carrying ore of good quality. Can you put on more men at once. Mill site in hand.”

HETTY GOLD MINE.—Copy of cablegram received from the manager:—“Black Reef. Have had samples assayed with following results:—2 ounces 10 dwts. per ton, 32 dwts. per ton, 15 dwts. per ton, 26 dwts. per ton. Prospects are encouraging on the west side property.”

KABOONGA.—Cablegram states:—“In the upper levels (south-west) wash dirt is dipping out south-east drive proves. Former wash dirt not yet reached. North-west main drive exceedingly wet, further indications of deep ground, suspended until drained.”

KING OF THE WEST.—A cablegram has been received from Mr. Burrell, the Australian manager, stating that all the leases have been transferred to the company, and that everything is in order.

LADY LOCH.—The following cable has been received from the manager, dated June 19:—“The mill has been running since last Tuesday; am starting 30 stamps this day on Lady Loch ore. Shall start Forrest King as soon as tramway is completed, which will be within the next week.”

LADY MONTEFIORE GOLD.—A cable received from the manager in Westralia to the effect that the reef on lease 79 had been cut 4 feet wide, showing pay gold, and that on continuing the crosscut he had struck another big formation of

ironstone quartz and decomposed diorite carrying rich milling stuff, the width not known, as after driving into it 11 feet the footwall had not yet been reached.

LEICESTER DIAMOND.—A cable received from Kimberley states:—“2925 loads washed, producing 122 carats, or an average of 417 carats per 100 loads.”

LONDON AND WESTERN AUSTRALIAN EXPLORATION.—The company's agent, Mr. A. P. Matheson, has secured an option of another nice-looking property at Pindinni, also option of two leases at Golden Towers (Woodley's Find), the prospects of which are very encouraging.—Find on Block 48, Hampton Plains. The manager of the company's prospecting party on this block reports:—“I have much pleasure in reporting very nice gold in No. 2 shaft. The gold has been seen in breaking the whole of the week; the stone dolly well, and the gold is never shotty sample. The stone at present is fully 4 feet wide.”

LOMBARDY GOLD.—The following telegram has been received dated Cue, June 22:—“Have driven 35 feet upon the lode at the 120 feet level. Lode is widening out and improving.” Official Note. Lode at date of last written report was 2 feet 6 inches, and assayed 2 ounces of gold per ton.

LUCKY GUSS.—The following cable has been received from the manager:—“Good ore is still being found in shaft; ore in in improving.”

LYDENBURG MINING ESTATES.—According to a cablegram received from Johannesburg it is understood that the transport of coal, stores, &c., from the railway to the mines in Lydenburg district, which has been stopped by the Government on account of rinderpest, has now been resumed.

MCKENZIE.—Mr. Frank Nicolas, the consulting engineer, has cabled as follows:—“Have struck a large orebody on the 40 feet level; the width of the vein is 2 feet, increasing as we go down. Rich in visible free gold. You may rely on the mine as a dividend-paying property.” A further cablegram states:—“Have discovered another reef on the property north of main shaft 1 foot wide, assays 2 ounces 15 dwts.”

MILLS' DAY DAWN UNITED.—The following cable has been received from the head office in Charters Towers:—“Have crushed during the month 973 tons of quartz for a yield of 394 ounces of gold.” The approximate value of this return is £1550.

MONASTERY DIAMOND MINES AND ESTATE.—307 loads last week yielded 41 carats. The company has received advice of the first consignments—184 carats—which is expected to arrive July 6.

MURCHISON UNITED.—The directors have received advices from their mine superintendent by mail, dated May 18, stating:—“At the lower level of the Lily Mine the drive north has been extended to 15 feet, and south to a total distance of 25 feet. Driving south, the roof, which had narrowed to 10 inches, has now improved to nearly 2 feet both north and south, but does not pan more than 5 or 6 dwts. free gold.”

NEW QUEEN.—Cablegram dated Charters Towers, June 22, gives result of crushing for past fortnight:—“119 tons, 69 ounces. Have drawn upon you for £500. We anticipate that our next clean up will be increased tonnage yield. Have shipped per Duke of Devonshire 112 ounces.” Note.—Owing to a mistranslation of the agent's cablegram of 9th inst. the number of tons crushed was stated to be 16, whereas it should have been 164 tons for 100 ounces.

NEW GUADALCAZAR QUICKSILVER.—A cable has been received from the mines, dated 15th inst., stating that the manager, who met with a serious accident in Mexico City, had sufficiently recovered to return to the mines, and that the furnace was to be started on the 16th inst. The further remittance of £500 has been duly received by the board.

NEW GUADALCAZAR QUICKSILVER.—According to advices just received from the mines there were at the end of the first week of June 590,290 lbs. of ore on the patio, containing 12,744 lbs. of quicksilver.

NIEKIRK (Klerksdorp).—The following cablegram has been received from the consulting engineer, who has just paid a visit of inspection to the property, June 19:—“After carefully examining the present workings my conclusions are that the mine has been worked at the lowest cost possible. The improvement in the mine is most marked. I believe it will develop into a good steady dividend payer. Has become a very valuable property.”

NO. 9 MILE PROPRIETARY.—Copy of cable received from Mr. C. C. Macklin, the company's agent at Perth:—“Venture Syndicate's expert reports: Have the very highest opinion of mine. At present we have 15 heads of stamps running on low grade ore. Shall begin running 20 heads as soon as new boiler arrives. Immense body of stone from different lodes will average at least 25 dwts. This will leave margin profit for dividend purposes; could very much be increased by treating larger bulk. Recommend additional 30 heads should be ordered. By the time these were erected sufficient water to run should be obtained. You may expect better returns as soon as ore averaged up.—Battery. Everything running smoothly.”

NO. 9 MILE PROPRIETARY.—Copy of cable received from Mr. C. C. Macklin, the company's agent at Perth:—“Venture Syndicate's expert reports: Have the very highest opinion of mine. At present we have 15 heads of stamps running on low grade ore. Shall begin running 20 heads as soon as new boiler arrives. Immense body of stone from different lodes will average at least 25 dwts. This will leave margin profit for dividend purposes; could very much be increased by treating larger bulk. Recommend additional 30 heads should be ordered. By the time these were erected sufficient water to run should be obtained. You may expect better returns as soon as ore averaged up.—Battery. Everything running smoothly.”

OUCRO PRETO.—This company has received a cablegram, giving the May returns as follows:—“Passagem Mine, 3720 tons produced 1557 ounces. Raposo Mine, 370 tons produced 53 ounces.”

PRINCESS ROYAL (Cue).—Cablegram from the company's consulting engineer dated June 23:—“Number of tons of ore in sight in the mine above water level 10,000, at least 8000 high grade ore; prospects are undoubtedly good; stopes looking exceedingly well.”

ROYAL SOVEREIGN.—The following cable has been received from Coolgardie:—“Have had temporarily to stop sinking the winze where the rich strike was made a few weeks ago, owing to a large influx of water. Generally the mine looks spick and span.”

SAN SALVADOR SPANISH IRON ORE.—The a.s. Sully sailed from Santander on the 22nd inst. with 1620 tons of this iron ore for Glasgow.

SHEBA.—The following cablegram has been received from the general manager:—“Struck a rich body of ore No. 17 winze; has the appearance of good body of ore.”

SILVER KING.—Cable from the manager at the mines:—“First half June crushed 900 tons; estimated production, 5500 ounces silver.”

ST. JOHN DEL REY.—The following telegram was received from Mr. Chalmers:—“Produce 10 days, second division, June 7000 oitavas, equal to 807 ounces troy; value £2712. Yield per ton 4.3 oitavas (50 ounces troy).”

TUER RIVER.—The following cablegram has been received from the British and Transvaal Financial Company, Johannesburg:—“You can advise London that reef Erasmus Hoop is now over 2 feet of good gold.”

TAMWORTH GOLD.—Telegram from Dr. Pratt, dated June 20:—“Have had to suspend work since a serious fall. Recomenced to stamp on June 17; the yield amounts to 41 ounces of retorted gold from 9 tons.”

VICTORIA REEF.—Manager reports:—“So far as we can judge the reef would keep a 40 head battery going for years, as everything from wall to wall must go through. The prospects of the whole field are improving.”

VICTORIA GOLD MINING ASSOCIATION.—The following cablegram has been received at the London office:—“460 tons crushed yielded 815 ounces gold.”

WEST AUSTRALIAN GOLD CONCESSIONS.—The representative at Perth, W.A., telegraphs as follows under date of June 19:—“Golden dyke. Stone from the main shaft assays 5 ounces 12 dwts.”

WESTERN AUSTRALIAN DEVELOPMENT.—Mr. Frank Nicolas, the consulting engineer, cables as follows in regard to the Dorothy Mine, owned by this corporation:—“Dorothy. The main shaft is down 64 feet. Expect to strike reef at a depth of 72 feet. Small stringers of quartz were met with at 60 feet showing gold.”

YALGOO PROPRIETARY.—Copy of cablegram received from Mr. Arthur Nicholls, the representative of the Yalgoo Proprietary Mines, who is now visiting the mine:—“Mine is looking well. The developments and workings satisfactory. I estimate the amount of ore in sight at many thousand tons. Fresh water in any quantity obtainable on properties for mining purposes. Railway within 10 miles from Yalgoo. Sending report by to-day's mail detailed as to machinery.”

WAHI GRAND JUNCTION.—The manager cables June 26:—“Grand Junction engine shaft is down 338 feet. Wah West prospecting shaft crosscut is driven 315 feet north; 73 feet south.”

WOODSTOCK SOUTH.—Cablegram received June 25 from the manager:—“We have struck a very large ore body contiguous to the Clutha lode.”

REPORTS FROM THE MINES.

BRITISH MINES.

LEADHILLS.—W. H. Paul, June 21: There is no material change in the underground bargains since my report of last week. I am sorry to say that the water in our reservoir is very low and will be exhausted in a couple of days unless we get rain. The recent showers of rain did but little good in increasing our supply of water owing to the ground absorbing so much after the long drought. I trust rain will soon come or our pumping wheels will be thrown idle, smelting of fume has been completed, and we are now smelting ore and slag.

COLONIAL, INDIAN, AND FOREIGN MINES.

COLOMBIAN HYDRAULIC.—May 18. Run No. 207. After a run of 64 days, during which time the monitor was washing gravel about 900 hours, we cleaned up on the 6th instant a total of \$5712.80, or about £1140, with a profit of about £145. This poor result is entirely owing to the difficulties we have experienced in having to wash far more very heavy Spanish tailings than gravel.—Run No. 213. This was commenced to-day, and the water was turned on through the new line of pipe. I am glad to report that there was no failure either in pipe or gates. I estimate it will be about three months before we shall get to the place Mr. FitzGibbon left off at in 1894, but I should not care to say that there may not be very satisfactory returns before we reach that point. It will doubtless be remembered that it was on this south rim that good returns were taken out in 1893 and 1894. A great deal of the delay between the end of run No. 207 and the beginning of run No. 208 was owing to trouble in laying the sluices, the rest was in making the connections with the new pipe line.

GRAVEL FIELDS OF TIERRA DEL FUEGO.—Extract from progress report received from Mr. Hyacinthe Bouquette, the company's manager in Moseambique, under date May 15: I enclose a short but very favourable report of Mr. J. Lanigan O'Keefe, M.E., C.E., an English engineer, who inspected the Meyreilles claims on his way from Umtali to Chimolis. During my absence at Beira, prospecting work has been pushed forward, and the miner Pablo whom I left in charge, in addition to a number of small trial pits, has sunk two big shafts, one to a depth of 15 feet, in which we have come to water and a show of gravel, but without having yet touched bedrock. A little higher up he is sinking another shaft, which has already a depth of 10 feet, at the bottom of which we find the most extraordinary and at the same time the most satisfactory formation. In the yellow and red clay we find, as was already the case in the ferruginous formation which we struck in another pit, about 10 or ten handsome specks of coarse gold very slightly waterworn. At the bottom we have struck quartz not very wide just at present, rather common looking, but containing gold all the same, and then we have slightly waterworn boulders of decomposed rotten granite of a rather hard appearance owing to the layer of clay and felspar, which forms a sort of crust on it. This morning I panned one of these egg-shaped blocks weighing about 1½ lbs., and it yielded three coarse pieces of gold, of which two very fine ones do not weigh less than 2 to 3 centigrammes. M. Tabourin, a French mining engineer, was present when we washed this conglomerate, which he himself asked to be allowed to wash, so curious did he consider the formation, and he was very agreeably surprised at the result. He fully approves my plan of work, and my obstinate determination to get down on the granite rock. Convincing just as much as I am that those expert mineralogists are right who assert that here, quite contrary to the rule on other gold fields, one must look for the gold close to the granite itself, even if not in the granite itself. In a couple of days the Government Director of Mines will be here. I shall then be able to get titles of the property, and probably to send you a report of M. Tabourin, who asked me to allow him to study a smelting furnace evidently the work of the ancients, which I yesterday discovered on the property with its chimney and ventilating flues still in a good state of preservation, of which I will send you a full description by next mail.

OMEKO GOLD MINES OF VICTORIA.—The following is from the mining manager's report:—“I have extended main tunnel 38 feet, total 226 feet. South drive 15 feet, total 56 feet, reef about the same. North drive extended 21 feet, total 192 feet, 3 feet 6 inches. Lena tunnel extended 48 feet, total 28 feet. There is a good channel about 4 feet wide, with two good walls. The stone on the hanging gives over 2 ounces to the ton, and the footwall stone is about half-ounce stuff. I expect to get a good big shoot of stone if the horse of mullock cuts out. I think this is the shoot we

ASSOCIATED GOLD MINES OF W.A.—Mine manager's report for fortnight ending May 8: Adelaide (103c), shaft No. 1 sunk to total 115 feet. Two sets of timber and laths put in. Ground hard with weak walls.—Shaft No. 4. Crosscut west at 135 feet level extended to total 66 feet. This is stopped for present and working drive north on lode driven 12 feet 6 inches, improving as extended.—Lake View extended (101e), shaft No. 3. Crosscuts east and west at 104 feet level continued. West crosscut extended to total 67 feet 6 inches. East crosscut extended to total 98 feet. No change. Shaft No. 4 clogged up, and brace raised 7 feet preparatory to fusing horse whip. Total depth 100 feet. Drive south on lode driven to total 21 feet 6 inches and continues gold bearing, averaging about 1 ounce to the ton. Crosscut west extended to total 60 feet 6 inches.—Shaft No. 8. Crosscut west at 92 feet level extended to total 84 feet 6 inches. Reef is now width of drive—viz., 4 feet. Stone consists of quartz, the drillings from which show gold.—Australia East (72e), shaft No. 2. Crosscut extended to total 45 feet 6 inches. No change in ground. Shaft No. 8 sunk to total 71 feet. 13 feet of timbering put in. No change.—Australia (38e). Drive north at 92 feet level extended to total 77 feet. Driving south started three feet driven. No change. Stone carries gold averaging 2 ounces to the ton.—(Signed) William Oats.

BONNIE DUNDEE.—Mine manager's report for fortnight ending May 2: No. 3 vertical shaft. Have started to sink. The ground is bad for machines but it breaks well.—No. 3 shaft (underlaid on Victory reef), No. 1 level north. Extended 6 feet, total from shaft 314 feet. The reef is worth 25 dwts. per ton, but is only 4 inches in the face of level.—No. 2 level south. Have done but little driving. The reef in the face is 2 feet thick and very white. The stopes over the level have been looking poor, but have now greatly improved.

BRILLIANT BLOCK.—Mine manager's report for the fortnight ending April 29: Underlaid shaft. Sunk 4 feet or 108 feet b low the No. 5 level plat. Formation 16 feet wide with leaders of quartz through it. The No. 9 pit will now be put down.—No. 8 level east. Driven 17 feet, total from shaft 257 feet. There is no stone in the face. In the stopes over the level the reef is 2 to 5 feet thick, 7 to 12 dwts.—No. 7 level west. Driven 14 feet, total from shaft 159 feet. Reef in face 1 foot low grade.—No. 7 level east. Driven 9 feet, total from shaft 497 feet. Reef in face 3 feet, 17 ounces 18 dwts. In the stopes reef 5 inches to 3 feet, 7 to 14 dwts. No. 6 level west, in stopes over level, reef 6 inches to 3 feet, 17 dwts. stone. No. 8 level east, reef on eastern boundary stop, 1 foot, 15 dwts. quality. No. 5 level west, two small stopes over level, reef 6 inches to 2 feet, 6 to 9 dwts. No. 4 level east, flat reef stop, reef 6 inches to 1 foot, 14 or 15 dwts. New mill of 40 stamps. We shall be ready to start in about 10 days.

COLON.—The secretary of Colon Gold Mines (Limited) reports that the National Government of Colombia has sent a commission to the gravel mines in the department of Tolima to report as to the best means of settling the vexed question of pollution now pending between the owners of estates and the mineowners.

COLUMBIA (Charter Towers).—The manager reports for fortnight ending May 8 as follows:—The contractors have sunk the shaft an additional 3 feet, making the total depth from the surface 244 feet, and the total amount timbered 223 feet. The contract is now finished, but arrangements have been made to sink the shaft a further 50 feet at the same price. All work in connection with the erection of the new machinery is being pushed on as fast as possible. Timbers for the poppet legs and brace have been delivered on credit, and within the next fortnight tenders will be called for erecting them.

EAGLEHAWK CONSOLIDATED.—The following fortnightly report has been received from the mine, dated Maldon, May 11: I beg to report that the shaft has been sunk a further depth of 30 feet for the fortnight, total from the plat 71 feet or 1171 from the surface. The ground passed through in the last fortnight has been very much broken up and running very irregular. We passed through two flat leaders of quartz about 1 inch in thickness coming from the east.

FREDERICK THE GREAT GOLD MINING AND RECOVERY.—Copy of letter from Bendigo, dated May 15:—We have the honour to report to you the following progress in your mine during the past fortnight. Since last report we have been opening out north and south on the stope from the crosscut driven through the reef at the 580 feet level.—510 feet south of the main crosscut. On the north side we have opened out 12 feet north by 10 feet wide, and on the south side 14 feet by 12 feet wide. This face is of a very promising appearance, and the stone is making larger going south. The reef here is intermixed with a quantity of minerals, and shows a little gold. The rise above this level has been put up a height of 21 feet from top of crosscut. The stone in the top of this rise is also of very promising appearance and shows gold. The winze below the 580 feet south level has been sunk a further depth of 2 feet, total from level 69 feet, and holed through to the rise from level below. The stone broken from the winze rises and crosses through the reef has been crushed 253 loads, yielding 104 ounces 9 dwts. gold. This return we consider very satisfactory, as now that the winze rises and crosses we will soon be in a position to raise a large quantity of stone, which, if the above quality continues, and it has every appearance of so doing, it would leave a good margin of profit. We are pleased to report that the sandstone in the bottom of the winze mentioned in my last report was only an intrusion of country rock, as it has been proved since the connection that there is a large body of quartz on both the eastern and western sides of the winze. The level south at No. 6 or 780 feet from the surface has been driven 10 feet, and timbered total south of main crosscut 473 feet. There is a large body of stone still on the eastern side of this level. The tributaries washing the surface have obtained 3 ounces 18 dwts. 12 grains of gold.

HERBERT.—The following is an extract from the May report of the managing director at Coolgardie: We shall commence to open out the two chambers at the 65 feet level, east and west, and cut the two main reefs. This will again be repeated at the 100 feet level. On the northern boundary we are still breaking out first class stope from the 30 feet drive. In No. 3 shaft, also overhead in an open coasteen. By the time this section is finished I anticipate getting from \$80 to \$90 tons on the dump. Under foot the reef is going down in a solid body about 5 feet thick and of very good quality.

HANNAN'S ORO-YA (W.A.).—Mine manager's fortnightly report to May 8:—Oro-Ya main shaft 107 feet level sunk to total 112 feet, ground good, sinking. North drive extended to total 42 feet; south drive extended to total 43% feet. Lode still about same, gold showing in either drive. West crosscut driven to total 60 feet; have cut quartz and ironstone formation 4 feet in width, bearing gold and well defined, will drive on this shortly. The crosscut will be extended another 15 feet. A winze (air shaft) is started on lode to ventilate workings, also in view of stopping. Royal Mint west, No. 1 east, southern drive, extended to total 31 feet; no change. East crosscut driven 7 feet; nothing to report. No. 1 prospecting shaft sunk to total 36 feet, lode 5 feet wide; country hard for sinking. Shall continue owing to change in No. 1 shaft. A prospecting shaft sunk to total 35 feet. Lode has improved and is now 13 inches in width, and will widen out as depth is attained. Good prospects obtainable by water power.

HANNAN'S STAR.—The directors have received advice from their mine superintendent by mail, dated May 16, giving the following information:—

Douglas shaft has been sunk a total depth of 23 feet 6 inches from the plat or 129 feet from the surface. The ground still continues extremely hard. The levels north and south have been driven 98 feet on the course of the formation, which is still 4 feet wide between two good walls, and appears to be widening out going under foot. The whole of the formation is carrying a little gold, and a positive that it is the continuation and true course of the West Boulder lode formation.—Underlay shaft. The west crosscut has been extended to a total distance of 27 feet 6 inches from the shaft. Have passed through a number of bunches of quartz and ironstone, from which we can obtain a few specks of fine gold by dollying and washing. The country is underlying west and better for blasting, and I imagine the footwall of the formation should be struck next week, when I shall commence to sink the winze down to the south level from Dougongmore shaft.—James shaft. The contractors have extended the western crosscut to total of 154 feet from shaft. There is no change in the ground, we are still in diorite and am very much disappointed at not cutting the boulder lode; this, and believe the cause of its not having been met with is through it being thrown to the west. This west crosscut should be continued until the course of it is cut.—Epsom's shaft has been sunk to a total distance of 45 feet from the surface. The ground is the same as previously reported—viz., of decomposed diorite and ironstone veins, which are a favourable indication of lode formation. I have put in bearers and timbered up 17 feet.

LAKE VIEW SOUTH (W.A.).—Mine manager's report for fortnight ending May 8:—Underground work 100 feet level. Crosscut east extended to total 57 feet. No change in nature of ground. This crosscut has been stopped for present, and sinking the main shaft was resumed on 6th inst. Shaft sunk to total of 158 feet. Water increasing rapidly and making at rate of 5000 gallons in 24 hours. Sinking will go on night and day, including Sunday, until 200 feet is reached, provided the water can be kept under until arrival of pumping plant. Stope of level in main drive are being stripped, and the stone continues to show good gold. Width is almost the same—9 feet. The manufacturers advise that the order for pumping plant will be completed with all despatch; in the meantime everything is being done to get battery in thorough order.—(Signed) Wm. Oats.

LION (Mozambique).—Report of the superintendent engineer, Mr. Ninees, for the month of April.—No. 1 drive east on new strike. Measurement for the month 12 feet, total length 76 feet. There is no change to record here.—No. 2 drive east on reef. The reef will average about 3 feet in width, and is of uniform richness, showing well in the pan. Driving during the month 10 feet. I am starting to drive west on this reef.—No. 3 drive. Measurement for the month 11 feet, total length of drive 35'. With the exception of having passed through a bed of slate about 2 feet in width, there is no other change.

MENZIES GOLD REEFS PROPRIETARY.—The following information is to hand from the manager at the mines, under date Menzies, May 16:—Friday last, A shaft. Have extended west crosscut from the 207 feet level a further distance of 7 feet, total 40 feet. Ground extremely hard. Have extended north drive a further distance of 6 feet, total 73 feet. Reef averages 1 foot. Sample assayed 11 ounces 7 dwts, 12 grains gold per ton. Have extended south level a further distance of 3 feet, total 74 feet. Reef averages 10 inches. Sample assayed 4 ounces 17 dwts, gold per ton. Have sunk winze a further depth of 18 feet, total 35 feet. Reef pinched at present to few inches—B shaft. Have continued stoking from the back of No. 1 north and south levels. Reef averages in north level 1 foot and in south level 8 inches. Ditch sample equal to 1/4 ounce gold per ton. Everything in connection with the mines working satisfactorily.

MOSMAN.—Mine manager's report for fortnight ending May 8:—Wyndham underlaid shaft sunk 11 feet, or 54 feet below No. 11 level plat. Shaft commences opening out the level next week. No. 10 level east driven 5 feet, total from shaft 48 feet. Winze sunk 8 feet.—No. 10 level west. The stopes carry 2 feet of reef of good quality. The footwall winze from No. 9 level west is connected with these stopes. To work the two reefs separately and effectively a crosscut should be put into the footwall from No. 10 level.—No. 9 level west. In the stopes over this level the reef will average 13 inches of medium quality.—No. 8 level east. The winze has been sunk a total of 48 feet.—No. 8 level. Hanging wall stope, reef 30 inches, fair quality.

MCKENZIE.—Report from Mr. D. W. Welch, mine manager; Glenloth, May 15th. Fortnightly report. Main engine shaft 120 feet level, South drive on lode advanced 9 feet, total distance from shaft 23 feet. Lode from 9 inches to 21 inches wide, carrying two good walls and wearing a much better appearance, estimated yield 1 ounce gold per ton.—No. 1 shaft 40 feet level. No. 2 stope north advanced 42 feet, total distance from shaft 122 feet. No. 3 stope north advanced 29 feet from shaft. Lode in the above stopes from 4 inches to 20 inches wide, estimated yield 1 ounce dwts. gold per ton. South stopes above 40 feet level now completed and cut through to surface costeans. No. 2 shaft sunk 8 feet, total depth from surface 57 feet, and cut lode which is about 9 inches wide and much disturbed. South drive at 60 feet level on lode advanced 4 feet from shaft. North drive on lode same level advanced 3 feet from shaft. Lode is both drives much disturbed by small break slides. I anticipate getting better stones when the lode becomes more settled.—Supplementary report, May 19: No. 2 shaft south drive at 60 feet level is now clear of break slides, and the lode stone is showing gold equal to 2 ounces gold per ton. When this drive is sufficiently advanced will start to rise up to the 40 feet level preparatory to stopping.

NEW QUEEN.—The following fortnightly report has been received from the mine, dated Charter Towers:—No. 4 south level (footwall). Stopping has been carried on both over and under this level, the reef varying in size from 3 to 8 inches.—No. 2 formation. Stopping has been carried on over the south level. The ground is hard and at times bad for breaking. The reef varies from 3 inches to 1 foot. Judging from appearances the quality of the stone seems to be of a patchy nature, at times the reef carries a fair amount of mineral, and at other times it is very white.—No. 4 formation. No work has been done in this formation since my last report.—No. 5 formation. The western level has been extended a further distance of 6 feet, making it 52 feet from the straight shaft. The reef in the face varies from 3 to 9 inches. The eastern level has been extended a further distance of 20 feet, making it 80 feet from the straight shaft. The reef in the face II average about 3 feet, and is fairly mineralised. During the whole of the 20 feet of driving it has steadily improved in size, and appears to be improving in quality.—Quantity of stone raised during the fortnight, No. 4 south level (footwall), 71 trucks; No. 2 formation, 233 trucks; No. 5 formation, 20 trucks; total, 391 trucks.

NIEKERK. (Kerkdorp).—Extract from the manager's report for May: Developing work has been pushed this month in No. 2, No. 3 and A 1 winzes and in the crosscut north from No. 1 winze. The shallowest of the old workings have been pierced by No. 3 winze, and both at this point and in A 1 winze rock of a better value than heretofore has been met with.—No. 1 winze. The crosscut north has been driven a further 52 feet, and is now in a total of 142 feet. Ralls have been laid up to the forebreast of the crosscut and a 6 inch hand-power geared air fan placed at the mouth of the winze, and piping driven from this through 80 feet of the incline and 90 feet of the crosscut, so as to reach within 52 feet of the forebreast.—No. 2 winze. The incline has been sunk a further 26 feet, and is now down a total of 113 feet. The reef has somewhat suddenly flattened with a dip of 51° to 48°, and for the moment we are sinking in the footwall and gradually raising our sills at a grade, while sufficient to allow for the running of our skips, at the same time to bring the reef again into the shaft.—No. 3 winze. We have holed through from this incline into the shallower of the old workings in the earlier part of the month, and a pump was at once fixed to clear them of water, and when it was got under sinking was at once recommenced, and during the month we have sunk a further 18 feet, making this incline a total of 67 feet down. Upon examination the old works were found to consist of: A vertical shaft 54 feet down from surface from whence a crosscut was put in south 15 feet to the reef, from which a drift was put along in the lode 35 feet east and west of the crosscut, or for a total length of 79 feet. A further crosscut 23 feet south, and into the footwall of the lode was also driven from the extreme west end of the drift. From measurement I should say the old miners stopped some 203 tons of conglomerate ore from these workings. The reef at this point dips at an angle of 60° and is 3 feet wide, the conglomerate is lying in three separate veins, intersected by very thin clay seams, the lower or foot vein apparently here carries the better gold. The foot and hanging wall are excellent, and the width of the reef should give every facility for cheap stopping.—A 1 winze. The sinking of this incline has been pushed on, a further 31 feet having been sunk during the month, and we are now down a total of 67 feet. The reef is now altering its direction of dip from 54° to 40°, and consequently we are expecting to go much flatter. The width of the lode is about 2 feet, and assays this month have given from 1 ounce 2 dwts, 12 grains to 1 ounce 4 dwts, 22 grains to the ton of ore.—General remarks. This month we have driven and sunk 130 feet (or an average of 5 feet per day for 28 days), of which 79 feet have been sunk and 52 feet driven. The general country as the incline deepens is getting tighter, and the drilling is becoming more arduous; on the other hand, our walls, which hitherto have been difficult to contend with, show a great improvement, and we have less frequently to timber, and we consider the country rock more favourable to mining. The weather having been inclement, cold winds and frosts having set in, the natives, who have during the summer done their cooking in the open, have had a kitchen built for them. A shelter has also been made for oxen in the shape of a rough kraal. The Blinder Act closing down all the ox wagon transport, upon which this district mainly depended for its supplies, caused some consternation, as the Act was put into force without notice, but beyond increasing for this and next month the cost of food and coal, and delaying the arrival of the remainder of the consignment of tools forwarded from England, it has in no way interfered with the progress of this mine up to date; the mule trains having now commenced to run between here and Kronstadt Station, the back of the difficulty may be considered broken. The Elandslaagte, Ariston, and other mines that closed down consequent on the proclamation of the Act, did so in my opinion prematurely. We have had three natives in the hospital with frost-bitten hands and feet, otherwise the usual good health of the mine has been maintained.—(Signed) Joseph Hassall, manager.

PALANG CORPORATION.—Report for April: Pollock's level No. 1 below adit. Winze B was sunk 24 feet when connection was made with the next level. In the intermediate stopes the lode is of fair size, the yield for the month was 350 tons from 8 to 8½ per cent. Level No. 2 below adit advanced 33 feet, total from crosscourse 402 feet. Lode poor.—Winze A. After sinking 18 feet holed through to the rise from the next level. Level No. 1 below adit driven 7 feet, total from rise 83 feet. Early in the month a small vein bearing north west was met with and followed for 11 feet, at which point it was cut out by a flat floor dipping south east. We have the same floor now in the end of the drive. Surface work. By the end of May the necessary foundation work for the new pumping engine for this mine should be finished.—Nicholson's adit. The crosscut from Bell's lode was advanced 15 feet, total 58 feet, country very hard. Level No. 1 east advanced 31 feet, total 349 feet. Lode small, carrying a little tin and copper. Overhand stope lode of fair size, return from same 224 tons of 7 per cent. stone. Willink's adit east was advanced 27 feet, total from crosscut 157 feet. Lode opening up well full width of drive, 18 tons obtained from same assayed 7½ per cent. In the overhand stope the lode is smaller; these returned 75 tons of 4 per cent. stone.—Teague's adit. Air shaft sunk 2 feet, total 20 feet. Lode just making in south side. Western stope lode 4 to 7 feet wide, yield 115 tons of 3 per cent. ore. Eastern stope yield 170 tons of 3 per cent. ore. The first 300 of this level being heavily timbered and requiring constant repair (it is distinctly under old surface working) I have thought it advisable to drive another level in solid ground. By putting in this level I also obtain a rise of 10 feet above the main tramroad, which enables a picking table and ore shoot to be constructed. To push through the work quickly the drive is being attacked from two ends. Amount driven during month 52 feet.—Joram Batang. Adit west was advanced 25 feet, total from the south level from Dougongmore shaft.—James shaft. The contractors have extended the western crosscut to total of 154 feet from shaft. There is no change in the ground, we are still in diorite and am very much disappointed at not cutting the boulder lode; this, and believe the cause of its not having been met with is through it being thrown to the west. This west crosscut should be continued until the course of it is cut.—Epsom's shaft has been sunk to a total distance of 45 feet from the surface. The ground is the same as previously reported—viz., of decomposed diorite and ironstone veins, which are a favourable indication of lode formation. I have put in bearers and timbered up 17 feet.

PALANG-KABANG.—Report for April: Branda No. 3 east. During the month 37 feet has been driven in this end, total 126 feet. The lode has continued well defined, and about 2 feet wide, but without tin. Finding the driving from the bottom of the winze slow and expensive, I stopped it after 9 feet had been driven, total 45 feet. In sinking the winze the lode continued rich to about 27 feet. Below this it broke into the hanging wall and became loose.

At a point a short distance below this break I have driven a crosscut into the hanging wall for 13 feet, to make sure no other place had gone off in this direction. In the crosscut we have cut one or two small veins of lode faster than the reef, and have stopped this, and put the men to drive directly opposite into the footwall to prove this part as well.—Kabang Smyth's lode. Has been continued a further distance of 7 feet, total 41 feet, total 93 feet. We have intersected the lode, which is about 20 feet wide. The lode has a promising appearance, is easy for working, and carries a trace of tin. The crosscut went through the lode, I have stopped it, and put the men to drive on the footwall side of the lode, as this appears to be the better part.—Alvalla. I am putting down a test bore hole in the reef below Myall hill. The hole is now down 72 feet. It is in a very hard blue clay containing a fair percentage of iron pyrites and lumps of slate rock, but without tin. We have been boring through this blue clay for before, as I cannot hold out hopes of success or otherwise.—Fredrik. John Rich.

SUNBEAM AND VIGILANT.—Report of progress during the week ending May 9: Sunbeam lease. The progress in the crosscut west shaft No. 1 has been quite fair considering two of the men being employed in costeanning instead of pushing forward the ground. I think as we have now gone 90 feet in a westerly direction from the shaft it would be more advisable to continue sinking than to continue costeanning. A little timbering will have to be done in the shaft end of the crosscut east, which will slightly delay the progress of the sinking next week. Shaft No. 9 continues to make fair progress and the stringers of quartz and ironstone are strengthening as they go down, and continue to come into the shaft. The prospect here is good, as any fire assays we have taken from these quartz stringers go 3 dwts. to the ton, whilst one has gone 7½.—Sunbeam north lease. Of this, No. 2 shaft, and the crosscut east much less was expected by Mr. Hancock, but as we have gone 80 feet from the shaft without obtaining any good result, and have passed through what would appear to be an iron stone reef without obtaining a colour of gold. I have thought it better to continue sinking, which we are now doing in rather hard ground, which includes a considerable quantity of ironstone.—Sunbeam east lease. We have continued the crosscut west in shaft No. 315 feet, as it seemed possible we might

meet with a change, but as we are now 155 feet in this crosscut I have thought it better to stop and commence a new crosscut in a north-westerly direction. We have put a little timbering in the winze and have gone down to a total depth below the floor of the crosscut west 35 feet. We have commenced a costean in the north-west of this lease, in which there are good indications, but it is not yet deep enough to make certain of anything beyond the fact that we have a little quartz apparent striking east and west across a strong iron lode running in the direction of the leases north and south. This promises well, and we will open it up at once.—Sunbeam extended lease in shaft No. 4. After continuing the crosscut east 17 feet, making a total of 94 feet from the shaft to the face, continuing in porphyry, I came to the conclusion that it would be better for the present to stop the crosscut and continue sinking. This we did, and we have done nothing in the north-east costean, which is not promising, but having commenced the new costean in the north-west corner of the leases we have found quartz in connection with ironstone. The Lord Nelson lease to the east has a shaft about 100 feet deep from which they are crosscutting west, so far without gold but good.—Vigilant lease. In shaft No. 5 we have sunk 5 feet in very hard ironstone. In the crosscut west from above we have driven a further 3 feet in heavy ironstone and a little quartz without getting gold, and I have now stopped this crosscut, as we have I think got through the reef. The costeans are as before, but I contemplate a new one at once.—Vigilant north lease. In shaft No. 6 the only work done has been in the crosscut north, which is a strong reef and is going through ironstone, with occasional quartz leaders, they are, however, small in width and of no value in gold. In the costean

AUSTRALASIAN.—Fortnightly report of Captain John James, mine manager, dated May 7: During the past fortnight the shaft has been sunk 23 feet, total 824 feet and timbered 27 feet, total timbered 806 feet. The country sunk through was boulder conglomerate, very highly mineralised the last 18 feet. This belt of country was met with in the sinking of the Smithfield and Phoenix Golden Pile Company for about 20 feet in the middle of the top bed of slate. I went down the Smithfield and Phoenix Golden Pile Company's Mine yesterday, and at 600 feet there is a fine reef going north in the slate country and about 4 feet of solid quartz under the slate; this reef we are bound to get in our western crosscut. No crosscutting was done this fortnight owing to one of the pulley wheels getting a piece out of it through the bucket going to the head-gear; this has been repaired and crosscutting will be started Monday next.

BAYLEY'S NO. 2 SOUTH.—The following fortnightly report, dated May 13, has been received from the mine manager, Mr. W. M. Vivian:—At the 100 feet level south drive a further distance of 8 feet has been driven, making a total distance of 17 feet. The reef is 16 inches wide, but carries little gold. At the north drive no work has been done, the men being employed in scoring and timbering. At the winze 6 feet has been sunk, making the total depth 11 feet. The reef is 15 inches wide, carrying by assay 2½ ounces of gold per ton. At the water shaft timbering is still in progress.

COROMANDEL.—Superintendent's report for fortnight ending May 30: Prospect shaft. This shaft has been sunk 16 feet since my last report, and is now 26 feet 5 inches below the 700 feet level. The quartz which we struck in the south end of the shaft has now extended across the shaft, and is 3 feet wide, assaying 1½ ounce of gold per ton, 600 feet level north. This level has been driven 27 feet, making a total of 175 feet from the crosscut. This end has been driven through the crosscourse, and is now in firmer ground. Also the direction has been altered to the north-east, as instructed by Mr. Llewellyn.—500 feet level south. The crosscut east of this level has been driven 17 feet, total length 513 feet. There is no change in this end since last report.—200 feet level north. The rise in the back of this level has now been carried up 4 feet, making the total height 10 feet. Lode 3 feet wide, assaying 1 ounce 14 dwts. of gold per ton.—East shaft. We are still proceeding with the work of stripping down the shaft, which, I think, will be completed by about the end of the month.—500 feet level north. This level has been driven 5 feet, making a total of 211 feet. The quartz has split up into two branches, the footwall branch being 1 foot 6 inches wide, and the other one about 10 inches, the assay value of each being a little over 1 ounce. Rise in back of 440 feet of east shaft risen 8 feet 6 inches, making the total depth 134 feet 6 inches. Lode 2 feet 6 inches wide, assaying 12 dwts. This end has holed into the 320 level, and the machine has been placed to rise southern extremity of fold in 320 level north of east shaft. This rise has been carried up 10 feet. Lode 12 inches wide, assaying 5 dwts. of gold per ton.

CHAMPION REEF.—Fortnightly report of Captain James Rowe, superintendent, dated June 1:—Dalyell's shaft. This shaft has been sunk 6 feet 9 inches, total depth below the 840 feet level 52 feet, and is communicated with No. 3 rise in back of 940 south of Garland's shaft.—Garland's shaft. This shaft has been sunk 6 feet 3 inches, total depth 1056 feet 6 inches. Lode 2 feet wide, assaying 1 ounce 12 dwts., 10 grains of gold per ton. The 1040 feet level north of shaft has been driven 26 feet 6 inches, total length 152 feet 3 inches. Lode 1 foot wide, assaying 1 ounce 6 dwts. 3 grains of gold per ton. No. 1 rise in back of level (120 feet north of shaft) risen 6 feet 6 inches. Lode 1 foot 3 inches wide, assaying 1 ounce 8 dwts., 2 grains of gold per ton. The 940 feet level north has been driven 5 feet 3 inches, total length 544 feet. In this level we have entered the unproductive ground, and are now crosscutting east and west. The crosscut west of level (523 feet north of shaft) has been driven 6 feet 6 inches. Crosscut east (511 feet north of shaft) driven 10 feet. We have a good run of strata in the crosscuts. No. 3 rise above level risen 13 feet, total height 93 feet. Lode 4 feet wide, assaying 1 ounce 3 dwts. 22 grains of gold per ton. No. 4 new rise above level (120 feet north of No. 3) risen 2 feet. Lode 2½ feet wide, assaying 1 ounce 12 dwts. of gold per ton. Winze below level on west part sunk 8 feet, total depth 8 feet. We have suspended the sinking of this, and are now sinking on east, or main part of lode. Winze has been sunk 6 feet 9 inches. Lode 4 feet wide, assaying 1 ounce 15 dwts. 17 grains of gold per ton. No. 3 crosscut west of 940, south of shaft, has been driven 8 feet, total length 11 feet. Not having met with the part which was discovered in Nos. 1 and 2 crosscuts we have discontinued the driving. No. 3 rise above 940 south risen 6 feet 6 inches, total height 48 feet 6 inches. This is communicated with Dalyell's shaft. The 840 feet level north has been driven 11 feet 9 inches, total length 875 feet 6 inches. The lode is disordered and without value. Winze below 740 feet level in advance of the 840 end has been sunk 12 feet 6 inches, total depth 39 feet 9 inches. Lode 2 feet wide, assaying 1 ounce 14 dwts. 8 grains of gold per ton.—Bibbendale's shaft. The 740 feet level north of shaft has been driven 21 feet 6 inches, total length 67 feet 9 inches. This driving being in a north-east direction met with the lode at 46 feet 3 inches, and has been continued on same 21 feet 6 inches. Lode at present is 1 foot wide, assaying 1 ounce 3 dwts. 22 grains of gold per ton. The 740 feet level, which has been driven in a south-easterly direction, met with the lode at 44 feet 6 inches, and has been driven on same 19 feet 6 inches. Lode 3 feet wide, assaying 1 ounce 21 grains of gold per ton. The 640 feet level south of east crosscut on east part of lode has been driven 20 feet 9 inches, total length 333 feet 3 inches. Lode 2 feet wide, assaying 13 dwts. 22 grains of gold per ton. Incline winze below level on north part of shoot sunk 10 feet, total depth 31 feet. Lode 1 foot wide, assaying 15 dwts. 5 grains of gold per ton. No. 3 rise above 540 south risen 12 feet, total height 97 feet. This is communicated with 440 feet level, and has opened up a good section of stamping ground.—Carmichael's shaft. This has been sunk 7 feet 9 inches, total depth below the 640 feet level 36 feet 9 inches. Lode has improved, is now 1 foot wide, assaying 1 ounce 15 dwts. 8 grains of gold per ton. The 640 feet level north on west part on which the shaft is being sunk has been driven 20 feet 6 inches, total length 88 feet 6 inches. Lode 1 foot wide, assaying 1 ounce 9 dwts. 8 grains of gold per ton. The crosscut east of this level has been driven 5 feet, total length 16 feet. At this point the middle part of the fold was met with, and level driven north on same 20 feet 6 inches. Lode 2 feet wide, assaying 2 ounces 12 dwts. 6 grains of gold per ton. The level driving south from top of No. 4 rise in back of 540 north of shaft, on east part, has been driven 12 feet 6 inches, total length 14 feet 6 inches. Lode 9 inches wide, assaying 1 ounce 1 dwt. 7 grains of gold per ton. The 440 feet level north of east crosscut has been driven 19 feet, total length 206 feet 3 inches. Lode 3 feet 9 inches wide, assaying 1 ounce 10 dwts. of gold per ton.—Rowe's shaft. The 615 feet level north of shaft has been driven 8 feet 6 inches, total length 96 feet. Lode 2 feet wide, assaying 1 ounce 8 dwts. 23 grains of gold per ton. Rise above 615 south risen 11 feet, total height 73 feet. Lode 9 inches wide, assaying 17 dwts. 21 grains of gold per ton. Rise above 515 south risen 12 feet 3 inches, total height 60 feet 3 inches. Lode 2½ feet wide, assaying 1 ounce 12 dwts. 16 grains of gold per ton.—New vertical shaft. This has been sunk 16 feet 3 inches, total depth 194 feet 3 inches. We have met with a branch of quartz in this shaft underlying east, which is 9 inches wide, yielding a trace of gold. The water here is increasing a little.—Stopes. We have 70 stopes working throughout the mine. The value and size of lode in each will be given in next report.

GREAT BUNINYONG ESTATE.—The following is the manager's report, dated Ballarat, May 18: Great Buninyong Estate. Alluvial shaft sunk 5 feet, full depth 114 feet. Water slightly increasing. At the quartz shaft the eastern crosscut has been driven for the week 23 feet, and the western 22 feet. Quartz leaders from 1 to 6 inches now showing in both faces. Water coming freely, but is nearly confined to the face; the ground passed through becoming dry as the drive advances.

GOLD FIELDS OF MYSORE.—Mine report for fortnight ending June 2: South shaft. Since the last report this shaft has been

deepened 10½ feet, making a total of 89½ feet below the 470 feet level. A little water is oozing, rendering it necessary to secure the hanging wall with timber. The lode in the bottom of the shaft carries 2 feet of quartz, underneath which we have 3 feet of lode matter. A sample obtained from it yielded on assay 8 dwts. 12 grains of gold per ton. There is no improvement in the crosscut west from the 380 feet level north, the ground now being much harder for blasting. During the fortnight 9 feet were driven, and the total length of the crosscut is now 224 feet. The 380 feet level south of the crosscut west was extended 6½ feet, its present length totalling 46½ feet. The lode, although much disordered, is 3 feet wide. The crosscut west at the 380 feet level south is still in dyke. Its total length is 39 feet 9 inches, showing an advance of 12 feet 9 inches. There is an improvement in the appearance of the ground in the end of the 470 feet level north, which was extended 18 feet in the last fortnight, making its total length 307 feet. The quartz in the 470 feet level south is 2½ feet wide, and the sample obtained therefrom shows a considerable improvement, yielding 12 dwts. 17 grains of gold per ton, as against 7 dwts. 4 grains in the last report. The total length of the level is 205 feet, of which 20 feet were driven in the past two weeks. In the rise in the back of this level 8 feet have been done, making the total 14 feet. The lode is 4 feet wide, composed of quartz yielding 8 dwts. 19 grains of gold per ton.—Stopes. During the past month the following was done in the stope. Back of the 280 feet level south stopped 8 fathoms 2 feet 1 inch quartz 6 feet wide, assay 1 dwt. 23 grains of gold per ton. Back of the 380 feet level north stopped 9 fathoms 1 foot 11 inches quartz 6 feet wide, assay 1 dwt. 7 grains of gold per ton. Back of the 380 feet level south (No. 1) stopped 7 fathoms 5 feet 3 inches. Lode 4 feet wide, intermixed with country rock, yielding 10 dwts. 11 grains of gold per ton. Back of the 380 feet level south (No. 2) stopped 2 fathoms 5 feet, quartz 7½ feet wide, assay per ton 7 dwts. 20 grains. This has been temporarily suspended, and the men put to sink a winze in the 380 feet level south to effect a prompt communication with the rise from the 470 feet level.—Middle shaft. Here we are carrying down the skip road and stripping the south end of the rise below the 280 feet level. At the 380 feet level the side of the shaft is being opened out to make room for cutting a plat.—Prospecting shaft. There is no change to report in the crosscut east of this shaft, which was extended 7 feet, total length now 53 feet.—Ajapullie. The total depth of this shaft, which is still all in lode matter, assaying 1 dwt. 7 grains of gold per ton, is 111 feet, of which 6 feet were sunk in the fortnight. Two trial pits are being sunk north-east of this shaft: No. 1 is 30 feet deep, and No. 2 has attained a depth of 25 feet, but nothing has as yet been discovered.—Cyanide works. Fair progress was made with the erection of the cyanide plant.

HAURAKI.—The manager reports under date May 7: I beg to hand you the following report for the four weeks ending 2nd instant, and up to date: The new pitwork has been fixed from the 220 feet level to the surface—namely, a 13 inch plough pole, which was started without a hitch, and is working admirably. The shaftmen are now engaged clearing the shaft, and making preparations for sinking below to the 300 feet level, and we hope to start sinking in the early part of next week.—No. 2 reef. The level north-west has been driven 94 feet from chamber, and communicated to No. 1 winze. The reef is very strong in the forepart here, about 18 inches wide, carrying strong quartz of gold in the stone, but as yet no picked quartz has been met with. The winze on No. 2 reef below the 160 foot is sunk to a depth of 60 feet. The reef averaged about 10 inches wide. Good gold has been got all the way down to the present bottom. The No. 2 winze to-day is deep enough for our 220 feet level advancing towards it north-west.—Stoping on No. 2 reef. Over this winze at the back of the 160 the reef throughout averaged about 12 inches wide, producing good crushing quartz and occasional patches of picked ore.—160 Iona crosscut. This crosscut was extended 18 feet, cutting through the hard dyke. We are now driving through good class of country rock very congenial for gold, and we hope on reaching the Castle Rock reef ahead to discover gold.—160 foot level. The crosscut north from New Year's reef cut through several small branches, one of which showed strong quartz of gold in the stone. We have opened out west on this said leader 20 feet. The total distance driven in this crosscut is 150 feet.—Cross reef below the 160. In driving north from the bottom of the winze 26 feet towards No. 2 reef the reef became broken up and poor. We are now engaged stoping north of the winze and getting good quality picked stone and crushing stuff for the stamps. The stopes on the cross reef above the 160 feet level are producing good crushing ore, and specimen quartz in the reef about 6 inches wide.—New Year's reef. The stopes above the 160 and 100 feet level (4 stopes) reef average 15 inches wide, producing good general crushing ores and occasional patches of picked specimen stone.—Stoping on No. 2 reef over 100 feet level. The reef averaged 10 inches wide, producing good general crushing dirt.—Driving north on Iona reef. This has been driven 20 feet. There is a greater improvement in this reef, the reef averaging 9 inches, producing good general stamping ore, with occasional picked stone.—Cross reef. The stopes about the 100 feet level average about 4 inches, and are producing good general crushing ores and occasional picked stone. The adit level is being put into the Iona shaft to carry the surface water off, and also to get access to the shaft to examine same with a view to repair it, and sink the same to open up the Iona reefs forthwith. The carpenters are engaged making launders to convey the water being pumped from the Haaraki shaft to the stamps. We have crushed for the month 300 tons of quartz, and treated 496 lbs. of picked specimen stone, which gave of melted gold 2121 ounces 19 dwts., and realised £65120s. 4d.—In conclusion, we expect the 220 feet level, in advancing from No. 1 to No. 2 winze, will open up a good run of gold. All other points in the mine are more or less of the same value.

NEW HAURAKI.—The manager reports under date May 7: A very pleasing change has taken place in the country rock through which the deep level crosscut is being driven, as fine clean heads of ground are met with frequently, thus enabling good progress to be made. A good deal of water is also breaking through the roof of level which led me to believe was coming from the South Tokates winze, and have now discovered it to be completely drained off. Four men have been placed to resume its sinking. Drivage for the month by eight men 31 feet, total 448 feet, so that means about the end of this month the South Tokates reef ought to be intersected. A drivage of 28 feet for the month by two men has again intersected the deep level east and west reef, making a total distance of level 177 feet. We are 2 feet into the reef and no hanging wall yet. The quartz is decidedly better looking, being more highly mineralised and carrying iron oxides. Samples from this reef are being taken for assay value. Nichol's deep level crosscut is greatly improved for driving, and the end is letting water out freely, particularly from a small stringer of calcite, embedded in iron pyrites and dark oxides, conspicuously showing in the country rock. Total distance driven 180 feet, being 47 feet for the month.—Queen crosscut. The month's drivage is 34 feet by two men, making a total distance of 96 feet, besides placing in six sets timber. The country rock is a pale blue sandstone full of iron pyrites; the heads of ground are usually lined with silica matter. Prospecting No. 1 crosscut west is also in pale blue sandstone country, and its characteristics are closely alike that of the Queen crosscut. Total drivage 86 feet by two men, being 51 feet for the month. Prospecting No. 2 crosscut north is in much stiffer ground than the other two crosscuts and of a dark speckled character running in layers. Month's drivage by two men 23 feet besides placing in three sets of timber; total distance 44 feet.—In conclusion, a decided improvement appears in the character of the quartz in our east and west reef, and our assayer will be testing its value shortly; the results I will give you in my next. Sinking south Tokates winze is also an important development, and the cutting of our south Tokates reef in the deep level. Two of our prospecting crosscuts also offer good chances of success. The rock is all that can be desired for gold.—Also under date May 14. Since writing my report we have cut into and cut through south Tokates reef in the deep level crosscut. The reef formation is 15 inches wide, the leader part being 6 inches, and carrying very good-looking quartz. The reef all throughout is largely charged with

iron pyrites, and carrying more iron oxides than is in the same reef in the winze which at the present time is being sunk and drained, now down 32 feet. No gold has been seen in the reef. From the point of crosscut we have to drive 31 feet south to come to the winze, and taking the line of reef then from the back of this level to the present bottom of winze, we have altogether to sink and rise 138 feet to prove the reef through and through. The total drivage in the Tokates crosscut to cut this south Tokates reef has been 175 feet. The bearing of the reef is 30° west of north, although as yet no gold has been met with in the reef. It looks more healthy for gold than anything seen in the shallow workings, and I hope by extended developments on the same to make good discoveries of gold.

ORIENTAL.—Superintendent's report for fortnight ending May 30: Taylor's engine shaft. During the past fortnight the men have been engaged cutting a tank at the north end of the shaft at a depth of about 130 feet from surface, to enable us to take up the water oozing from the floor above this point. This excavation has now been completed, and we shall forthwith proceed to cement the tank and build the necessary guttering around the shaft, besides completing a shelter for the miners, to prevent the necessity of their coming to surface every time they blast. Meanwhile we are carrying down the timbering of the shaft, and when sinking is resumed we anticipate no further interruptions on account of the water.—Bridge shaft. The 105 feet level south is now 170 feet long, showing an advance of 10 feet in the fortnight. The lode maintains its width, and is carrying a little more quartz, the sample from it yielding 3 dwts. 22 grains of gold per ton. We have forked the water to the 165 feet level. The men are now carrying down the footway, and making the necessary preparations in the shaft previous to starting to clean up the levels.—Trial shaft. During the past two weeks the level north was extended 4½ feet, making the total 8½ feet; while in the level south we drove 6½ feet, making a total of 11½ feet. The lode in the north level is about 4 feet wide, all quartz and pyrites assaying a trace of gold, while that in the south level is 3 feet wide, yielding 12 grains of gold per ton.

KAPANGA.—The manager's report under date May 4: During the month the shaftmen were engaged in cutting chamber at the 900 feet and timbering same, the dimensions of the chamber being as follows:—26 feet by 9 feet by 7 feet in the clear. The shaft was also sunk 12 feet and closed timbered; 16 men were employed about the above-mentioned work. About 16 feet below the 900 feet chamber we intersected a vein about 4 inches wide, bearing about 15° to the west of north, and underlying to the west at an angle of 45°. It is well defined, with good walls containing highly mineralised quartz, showing at intervals strong blotches of gold. We also intersected another small branch running 30° west of north and dipping east at an angle of 60° from the horizon. This is composed of quartz and pyg, and up to the present very little gold has been seen in it. This vein has junctioned with the first-mentioned one, and, no doubt, has something to do with making the gold. Seeing that the precious metal has been found at this depth of 916 feet, and strong gold at that, this speaks well for the future success of the mine. I may mention that the country rock is everything that can be wished for, very highly mineralised. It is more compact than formerly, and has not the disturbed appearance as seen in some of the shallow levels. At present I think it better to sink the engine shaft to the 1000 feet level, cut timber there, and drive a crosscut west to intersect these reefs; and I feel almost certain that when this is accomplished we shall get good payable ore—in fact, the indications so far lead me to predict a prosperous future for this company. The new cage roads will be put in from the 800 feet to the 900 feet during the next few days, as all the timber is now on the ground. The rise in the back of the 800 feet crosscut has been put up a further distance of 18 feet by four men. The reef is improving, and is at the moment about 4 feet in width. The quartz is somewhat mixed with the country rock, but the walls are better defined, making the reefs more settled, letting out water freely, which, to my mind, is a favourable indication that a change for the better is coming in. The quantity of water at this point has made the progress of rising rather slow. The rise above the 500 feet level on the Kapanga has been extended 20 feet. The lode has carried a kindly looking quartz, interspersed with a little arsenic which is a good indication for gold. It is about 10 inches wide, bearing the usual pyg on the walls. The drive north of the riser has been advanced 18 feet. The reef at this point is about 2 feet in thickness, with well defined walls and of a very promising character. We are expecting to strike some payable ore in this direction, as the indications are really good. The drive south of the reef has been extended 24 feet; this is being driven with the object of getting under Cotter's winze, which was sunk below the 423 feet level, and carried a little gold. It was suspended at the point on account of water. The reef is 9 inches wide, composed of solid quartz. If this block turns out according to our expectations, it will give us a large supply of ore for a considerable time, as we shall have over 100 feet of backs on the line of reef. The rise on the Kapanga reef above the "little intermediate" was put up 22 feet. The reef is 20 inches wide, but only contains ore of low grade. The stop south of rise measured 34 feet by 7 feet. The reef is 2 feet wide, composed of solid quartz, highly mineralised. This has not turned out to expectation, although we hope to be in the position shortly to report better prospects. The stop south of main rise above the 420 on the same reef measured 17 feet by 17 feet. The drive going north of Scotty's hanging wall branch at the intermediate was extended 18 feet. The water is gradually falling off, so we shall now be in the position to make better progress. The reef is 4 feet wide, composed of quartz and clay impregnated with iron pyrites. This should be an important point, and we hope for a discovery before long. The drive south of small rise above the 300 on Scotty's footwall branch measured 17 feet. The reef is very much broken and mixed with country rock, caused by the influence of the slide. So far nothing of importance has been encountered. The stop north of the rise measured 17 by 7. The reef at this point is 10 inches wide, exposing a fine body of quartz, and looks very promising, but no gold has yet been seen, although formerly it was got only a few feet away from this point of operation. The level driving south on the Kapanga reef at the 200 feet level was extended 17 feet; the reef, however, appears to be rather broken, consequently, we do not expect much until we get out of this class of country.—Corby section. The rise above the bottom level is put up 15' feet; the reef is 5 inches in thickness, carrying a good class of quartz, with plenty of mineral. Although of such an encouraging nature, we have not as yet seen the precious metal. The country rock is very hard at this point. The level driving south-west of No. 2 level was advanced 22 feet on what is supposed to be the Kapanga reef, which, although small, is composed of quartz and calcite, having a good hanging-wall. Altogether the prospects are of a most favourable character, and I cannot see how this can fail to prove other than a productive block.—Surface workings. This drive going south from the bottom of Cotter's winze is extended 21 feet. The country is bad shooting ground but full of iron pyrites. The leader itself is 1½ inch in width, bearing at times strong colours of gold and native arsenic. Our intention is to drive the No. 2 level through the Corby shaft to get under this winze, then put up a rise in order to intersect the lead which carries the gold. When it junctions with the Kapanga reef in all probability it will produce very rich ore. The new puppet heads are completed, and will be ready for working in the course of a few days. All machinery and pitwork are working well.

ST. DENIS.—The manager reports under date May 15 as follows:—Lease 1933. The timbering of the main shaft has been completed to a depth of 30 feet, and sunk a depth of 5 feet further, making a total depth of 35 feet.—Lease 1462. I am at present coesteaming near the boundary of the Glasgow Mine, endeavouring to find the shaft of gold found on the Glasgow Mine near our boundary.

GROOTFONTEIN EXPLORATION.—The manager (Mr. G. F. Aiston) writes under date May 29: Bore proceeding in shaft. Towards end of week sides of bore-hole began to drop in, and it was thought advisable to line the hole and reduce crown.

BIG BLOW.—The following fortnightly report, dated May 20, has been received from the mine manager, Mr. W. M. Vivian : Water shaft. The crosscut has been driven a further distance of 12 feet, making the total distance from the shaft 100 feet. As fore shadowed in my last report the ground has again become very hard, with no water. As an evidence of the hardness of the rock, I may say that over 300 drills require to be sharpened for the work every 24 hours. The nature of the rock is still a felspathic diabase.—Battery. With our diminished water supply we have only been able to keep 10 stamps going for 3½ hours per day. The water at the end of this time being too thick to run through the battery screens.

BLACK FLAG PROPRIETARY.—The following information is taken from the report of the manager just to hand.—South haulage shaft, No. 1 level. The crosscut has been extended to a total distance of 146 feet from the shaft. This crosscut is now 36 feet in lode matter, but the footwall has not yet been met with.—South pumping shaft, No. 1 level. The crosscut from this shaft has been extended to a total distance of 133 feet, 23 feet of which is in lode matter.—Storage tank for fresh water. This has been sunk to a depth of 11 feet, and it is intended to sink a further 9 feet, and then brick and cement the interior. The tramline from the central shaft to the north shaft is being rapidly pushed on with, and there remains now only about 250 feet of embankment to be constructed.—Open workings. At 430 feet north of the south pumping shaft a cut has been made through the reef to open up stopes at a convenient level for handling the broken mineral by means of a tramline from the south shaft to the mill. This will give a face 20 feet in height and 30 feet wide, and if carried on to the point where the tramline from the central shaft to the mill crosses the reef will provide some 30,000 tons of quartz, which can be handled very cheaply.

BREMNAES.—The following report has been received from the mine, dated Haugeund, June 19:—Risvig Mine. The 500 north level shows quartz 15 inches wide, containing a little mineral, &c., assaying 3½ dwt. gold per ton. The 400 north level has improved, with quartz 2 feet wide, assaying galena and copper pyrites. Assay value, 7 dwt. In the 200 south end the lode has assumed a more regular appearance, and is improving. A ran of quartz on footwall is highly mineralised, and assay over 6 dwt. gold per ton. Other workings in this section are without material change.—Fladencs Mine. The lode both north and south of winze shows improvement within the last few days, and several stones showing coarse gold have been broken from the south end.—Gapekog Mine. The lower north level is being driven by four men in a good strong lode, with nearly 2 feet of quartz, carrying a little galena. Several samples have panned gold.—Milling. We have cleaned up from 175 tons of quartz milled, with result 64 ounces bullion. Beyond this we have 7 ounces of gold from alluvial washings.

BRITISH BROKEN HILL PROPRIETARY.—Mining manager's report for week ending May 28:—Blackwood shaft. 56½ tons of lead ore was obtained from the stopes just below the 100 feet level, in eastern vein averaging 48 per cent. lead and 6 ounces silver per ton, and from the stopes just above the same level 20 tons lead carbonates, averaging 47 per cent. lead, and 9 ounces silver per ton.—Howell shaft. 100 feet level. Have transferred men from 10th and 11th floors of far north stopes up above 100 feet level, where they are preparing stopes for breaking large quantities of lead ore. Have started to put north drive in working order, and are fixing a tramroad from long west crosscut in through the ore body, where an ore shoot will be fixed so as to facilitate stoping operations above this point. We broke 58 tons lead carbonates from the 10th and 11th floors, averaging 39 per cent. lead and 3 ounces silver per ton, and 78 tons from the second floor averaging 46 per cent. lead, and 5 ounces silver per ton.—Surface. Change and bath house. The roof for this building has been finished; are now pushing on with baths, doors, windows, &c.—Electric light plant. Fair progress has been made with work of laying cables and connections over the works.—Jig plant. Are putting belts on pulleys throughout the plant; small details in connection with jiggers speedily approaching completion. The large buckets for wheel elevators are being placed in position as they arrive. The excavations for driving gear in front of large pumps are finished, and are now building up foundations. Gave jigger and large engines a trial run during the week, both working very satisfactorily.—Week's assays. Carbonates, lead from 33 per cent. to 58 per cent.; silver from 1 to 16 ounces per ton.

CENTRAL EXPLORATION AND INVESTMENT.—The following information has been received from Coolgardie, with regard to their mining properties: Tindals extended. The manager reports that the sinking of the main shaft has been resumed and that No. 3 shaft has reached a total depth of 82 feet. In No. 3 shaft the north drive has been driven 9 feet, and the men from this shaft have been put coesteening on the surface.—Great Tindals Consols, block 2141. In No. 1 shaft the crosscut has been extended to 36 feet, without change in the country, but the water supply is increasing. No. 5 shaft has been sunk to a depth of 17 feet in the dyke formation, which is still showing very rich quartz, and the formation by itself gives very good prospects. No. 6 shaft is down 10 feet. This is new shaft which has been started on the outcrop of the lode to the east of the No. 1 shaft to go down on the underlay. An office is being erected on this block. On block 2164 the crosscut from shaft No. 2 has been extended to a total length of 11 feet, and is about 2 feet 6 inches into the dyke formation, which carries a little fine gold, with a great amount of pyrites. The water in this shaft is increasing.—Great Hanover Mine. The main shaft has been sunk to a total depth of 130 feet. The work on the quartz reef shaft is proceeding very satisfactorily, and another shaft has been put on during the week. In the northern shaft the crosscut has been extended for a further distance of 5 feet, and drillings still showing fine gold. The west shaft on lease 2175 has been sunk a further 5 feet, and timbered 6 ft. t.

EMERALD (NEWCASTLE).—The manager reports under date May 14, as follows, viz.: Point No. 1, main shaft. This is now sunk to a depth of 44 feet, and the contractors expect to finish the 50 feet by Tuesday first, 19th inst. A number of small veins (unfortunately not showing any gold) have been met with in sinking this week. These all have an eastward dip. We do not anticipate intersecting any leaders of value until we reach a depth of about 60 or 70 feet. I regret to say that a good deal of trouble has arisen in our efforts to keep the water down sufficiently to permit the men to work in the shaft. This is caused by the pump now being used being unsuitable for the purpose required, and has been the means of some slight delay in consequence.—Well shaft (shaft No. 1). Only one man has been working here, and is raising fairly good ore from the small veins in this shaft. I shall put on an additional man next week, and continue to raise quartz for crushing. At present it is somewhat difficult to obtain really practical miners. As soon as these are to be had I intend putting on two more, and go on stoning here.—Point No. 3, shaft No. 1c. I am still continuing to stope and drive at this point, and to raise milling stone. No change has yet taken place in the reef so far, nor is there any appearance of it. The pump in the main shaft has not reached the water in the shaft as I expected, as I have not been able to test the ground below present water level.—Surface. I have now only one man obtaining surface stope just now, as I consider this sufficient until I know the result of the test I intend making shortly.—Shamrock, shaft No. 2. The contractors have driven for fortnight just ended 4 feet in the east end and 8 feet in the west end, total 12 feet. The reef in both ends still keeps about the same size.—Battery. I hope to start crushing the surface stone referred to either early next or the following week. I intend to put through as soon as possible a number of test lots (say) of 10 tons each obtained from various parts of the mine.

EAST MURCHISON UNITED.—The following are extracts from the mine manager's report, dated May 2:—Great Eastern, No. 1 shaft. The drive east has been advanced 17 feet on the large body of stone mentioned in my last report. The ore from samples tried gives an average value of about 1 ounce 5 dwt. per ton.—No. 3 shaft. The drive west has been extended 26 feet for the month, total distance driven west from the shaft 164 feet. Lode in face 12 inches, ore value 1 ounce per ton. During the last few feet of driving the lode has assumed a more regular and better defined appearance and a higher ore value. No. 4 shaft has reached the water level, which is 65 feet with no improvement in the character of the for-

mation. Water shaft sunk 45 feet for the month.—The True Blue, No. 1 shaft. The drive west has been advanced 19 feet for the month, total distance from shaft 36 feet. Lode compact and well defined but small, 8 inches of ore showing in the face, value about 1 ounce 2 dwt. per ton. Drive east has been extended 26 feet by contract for the month, total distance from shaft 47 feet.—No. 3 shaft. Since my last report levels have been opened up east and west from the bottom of this shaft in the east drive 15 feet from the shaft. West drive has been advanced 15 feet from shaft. Several veins of quartz have been intersected, all of which show colours of gold.—No. 4 shaft, True Blue reef. This shaft has been sunk to a depth of 58 feet, at which point the water was met with. In the last 5 feet of sinking a change for the better appeared in the country, and the lode opened out to 12 inches clean quartz, carrying a little gold.

FORTUNA.—Mine report, dated June 17: Canada Incosa Mine. In the 110 fathom level driving west of San Pedro's shaft the lode has become unproductive. We have now started the sinking of San Pedro's shaft below the 110 fathom level, and hope to reach the necessary depth for the 125 fathom level towards the end of August.—Los Salidos Mine. In the 212 east of Taylor's engine shaft we have met with a vug, which has rendered the lode unproductive. In the 200 south nothing of value has been met with. The lode in the 92 west of Palgrave's shaft continues unproductive. Santo's winze sinking below the 200 has holed to the 212 fathom level. The lode was worth 1½ ton per fathom. The stopes are yielding fairly well. Surface works are kept on with great regularity, and the machinery is in good working order. Estimated raisings for June, 200 tons. The tributaries returned 67½ tons of mineral in the past month.

CRAVEN'S CALEDONIA.—The following fortnightly report has been received from the mine: In the underhand stope from No. 8 level the reef averages 8 inches. In No. 7 level on the hanging wall reef has been extended a further distance of 10 feet, making a total of 61 feet. The reef in this level averages about 6 inches thick. In the eight stopes over this level the reef averages from 5 to 8 inches of fair quality stone. The haulage of quartz for the company for the fortnight is 40 tons, making a total of 64 tons in the paddock. Hooper and party in No. 6 level have got about 10 tons of stone broken. Daddow and party have extended No. 5 level a further distance of 1 foot, making a total of 31 feet from the starting point, and this party have got about 5 tons of stone broken. Gibbon and party have put through a crushing at the Prudential mill of 56 tons for a yield of 75 ounces 2 dwt. 12 grains of melted gold, from which the company received tribute amounting to £29 13s. This crushing came from the Victoria reef.

GREAT FINGALL REEFS.—Mine manager's report for the week ending May 9:—Block 366, No. 1 shaft, 50 feet level, south drive. Men engaged cutting plat at 50 feet level and securing shaft. The south drive was extended 1 foot, and the reef is 9 inches wide. During the week we shall start crosscutting for reef A.—Block 366, No. 3 shaft (main), north drive on reef E, 102 feet level, west crosscut. The reef this week is 2 feet wide, but remains poor in gold, carrying only a few pennyweights of gold to the ton.—No. 8 shaft, 50 feet level, south drive on reef. Reef averages 9 inches in width, and yields about ½ ounce per ton.—Erection of plant. Splash plates, covers, and water inlet pipes have been fitted to boxes. The foundations for boiler smoke stacks are nearing completion. A start has now been made with the setting out and framing of the poppet heads. It has been necessary to make a complete alteration in the smoke stacks to suit local conditions. The alteration consists in cutting off the existing curved ends and substituting flat bottoms, which will sit on the stone foundations. This work is now well advanced, and the stacks will soon be ready for hoisting into position.

KINSELLA.—Mine report for fortnight ending May 14: 43 feet level, north stope, sections 14 and 15. Six men breaking stone for battery, reef averaging 4 feet wide.—43 feet level, No. 2 winze north, section 14. Have sunk 10 feet for fortnight, making total depth 30 feet below 43 feet level. Two men here.—100 feet level, north drive, section 14. The distance is now 231 feet from crosscut, making 11 feet driven for the fortnight. Two men working here, 33 feet yet to drive to reach No. 2 winze.—No. 2 winze south, section 21. Have started a stope north and south of this winze; 12 men engaged here. Lode 5 feet thick. Have started to cut water lodgement at 100 feet level, east of shaft, preparatory to sinking main shaft deeper.

KOMSELLA REEFS.—The manager reports under date May 6: The No. 2 crosscut has been extended 7 feet through Argall's lode, which proved the width to be 13 feet. There is a horse of mullock in the centre with branches of quartz on each side, or in all a payable ore body 8 feet in thickness. At this point we commenced driving south on footwall portion of the lode, and this has been advanced 33 feet, carrying good payable ore the whole distance. The drive on Argall's lode north of main crosscut has been driven 20 feet. The ground has been very hard, and the rock awfully tough to break. The men were also employed breaking up a large piece of the bottom and putting down a flat sheet at the main crosscut, and also laying track road into the present face. Now, however, the reef is getting easier to work, and the quartz extracted is of fairly high grade, the average value per ton of ore being £4 10s. This, I may mention, is the average taken from several samples, some of which went as high as £13 per ton. In extending the main crosscut farther east Lavington's lode was intersected, and has proved to be fully 20 feet in width. This is a splendid body of ore, and several samples were assayed from various parts of the reef, giving an average of about £2 15s. per ton. There is every reason to believe that this large lode will prove to be very valuable when further developed. The total distance of the crosscut is now 357 feet. The extension of this crosscut will be pushed ahead as rapidly as circumstances will permit, with the object of striking the Black reef, which on the surface can be seen ranging from 8 to 10 feet in width. The sawyers were employed cutting timber during the month, and the surface men were engaged excavating ground for the assay office, which is being built as quickly as possible. Rather poor progress has been made during the last fortnight on the water race owing to bad weather. 44 chains of bench work is completed, and 11 chains of ditching. The carpenters are erecting the trellising work, and all the timber is of first-class quality. Five pairs of sawyers are employed about this work. Taking all things into consideration, I think we are getting on fairly well. The construction of the road up to Komata Creek is now being energetically carried out by the County Council, and I am hoping, weather permitting, that this will be concluded in about two months, when the machinery will be taken over on to the battery, and erected with all dispatch.

LINARES.—Mine report dated June 17: Pos. Ancho Mine. In the 200 east of Warne's crosscut the lode is wide, but still without ore to value. The 200 west of Warne's crosscut turns out some stones of ore, but not sufficient to value. In the 178 west the lode is large with spots of ore throughout, and is valued at ½ ton per fathom. In the 200 west of Peill's engine shaft the lode is small and the granite hard for driving through. The lode in the 178 west is rather small at present. No. 280 winze below the 178 fathom level has fallen off in value, but the lode continues large, and worth ½ ton per fathom.—Los Quinientos Mine, Taylor's engine shaft. In the 200 east the lode is more promising, and contains some good stones of ore. The 185 east has improved during the past week, and is yielding fine lumps of ore, valued at 1 ton per fathom. The 185 east continues large and strong with patches of ore, estimated at ½ ton per fathom. The lode in the 150 east is large, but does not contain ore to value. Victor's winze sinking below the 185 fathom level, nothing of value has yet been met with.

LYDENBURG (Transvaal).—The manager (Mr. J. A. Woodburn) writes under date May 28:—We have found outcrops Nos. 1, 2, 3, and 4 of what may be called the lower seam in the dolomite. The width between outcrops Nos. 1 and 2 is only about 400 to 500 feet, and between Nos. 3 and 4 500 feet, but as hills widen towards the south, and this seam dips in that direction, it is natural to expect that the seam will be found in this wide area.

MYSORE WEST AND MYSORE WYNAAD.—Tank Mine. Monthly report for May: South shaft. The water was in fork on the 18th inst., and work resumed in all bottom levels. The skip

road has been completed, and we are waiting for the skips to arrive from Madras which we expect in a day or so. We have commenced to cut the hopper at the 507, and hope to complete it in a week or two. 507 level, No. 1 drive north on west lode, has been carried on to a distance of 112 feet, progress 11 feet. The lode in the end is 2 feet 6 inches wide, and is worth 8 dwt. per ton. 507 level, No. 2 drive south on east lode, is in 104 feet 6 inches, progress 11 feet. The lode is 1 foot 6 inches wide, and is worth 8 dwt. per ton. 507 No. 3 drive north on east lode has been driven to a distance of 96 feet 6 inches, progress 20 feet. The end is still mixed, but shows 3 feet of quartz worth 6 dwt. per ton. 450 north end is in 549 feet 6 inches, progress 19 feet 6 inches. The lode is pinched to about 3 inches, and is worth 4 dwt. per ton. Work in this end has been suspended for the present to develop the 507 north end. 450 south winze was sunk by hand to a depth of 42 feet when it holed into the 507 level south on east lode. The quartz is 3 feet wide, and is worth 10 dwt. per ton. We shall start stopes north and south from this winze as soon as possible. 450 north stope No. 2 is 3 feet wide, and is worth 5 dwt. per ton. 450 south No. 2 stope, 4 feet of quartz worth 10 dwt. per ton.—South intermediate stope. In this stope we have reached the top of the shoot, and the quartz has pinched down to 1 foot wide. We have, therefore, stopped operations.—450 north No. 1 stope. We have started a stope in the 450 north of main crosscut. The quartz is 10 feet wide, and is worth 4 dwt. per ton. We started a winze on the east lode from the 450 north winze, and carried it down 8 feet, when the quartz pinched out, so we shall start a rise above the 507 north on east lode to hole to this winze. Walker's shaft is down 83 feet 6 inches; progress 5 feet. The water is very quick, so we have to put down a larger donkey pump to keep the water. We have completed the skip road, and hope to start the boring machines in a week or so. Owing to several outbreaks of cholera in the district the coolies have left and gone to their villages, consequently the work in the mine is practically suspended for the time being.

NAMQUA COPPER.—The following is an abstract of superintendent's report for April: Tweefontein Mine. The shaft is now 140 fathoms deep, and it has been decided to drive a level at this depth instead of at 137 fathoms.—140 fathom level. The ground in this driving is of the same kind as that in the shaft.—125 fathom level north-east. At this point has been met with what may be considered the lode on the eastern side of the crosscourse. Worth one ton of ore per fathom.—125 fathom level south-west and east. Work here is suspended. Worth one ton of ore per fathom.—115 fathom level No. 36 winze. The lode is not of so much value as it was nearer the bottom of the level. Worth 4 tons of ore per fathom.—Stopes. 125 fathom level east, back of level. This stope is yielding good class ore, and is worth 5 tons of ore per fathom.—125 fathom level east. The lode is of great breadth, but the quality is not so good. Worth 6 tons of ore per fathom.—105 fathom level west. The north part of this stope has fallen off in value. The south part looks well. Worth 8 tons of ore per fathom.—95 fathom level east, bottom of level. The ore is extending well on the north side, and is worth 8 tons of ore per fathom.—No. 2 shaft, stope Nos. 1 and 2. These are each worth 8 tons of ore per fathom.—No. 4 shaft, intermediate level east. This level is immediately over the stopes above referred to, and is worth 7 tons of ore per fathom.—Intermediate level west. A bed of ore is being followed, but it is not likely to extend far. Worth 3 tons of ore per fathom.—12 fathom level east. At this point only a part of the breadth of the lode is seen. Worth 5 tons of ore per fathom.—No. 5 winze. This winze has been sunk through to the intermediate level. Worth 7 tons of ore per fathom.—No. 6 winze. This is a short winze to communicate with the stope from No. 2 shaft, and is worth 5 tons of ore per fathom.—No. 5 shaft, west driving. A little copper ore is still found here.—Wheat Julia Mine, central shaft. There is nothing new at this place.—Shipping. The Magnet arrived at Port Nolloth to load on May 20. The Methven Castle arrived at Swansea from Port Nolloth on June 6 with 2230 tons of ore.—Output for May, 600 tons of ore of 27 per cent.

NO. 7 NORTH-EAST QUEEN.—The following fortnightly report has been received from the mine, dated Charters Towers, May 8: I beg to report that Penhallwick and party have their drive in a distance of 78 feet from the shaft, with about 2 feet of stone in the face of fair quality. In the stope at the back of the level they have from 12 to 20 inches of stone of good quality. Mount and party have sunk their winze a distance of 60 feet, and have now come up and commenced opening at 40 feet from the level on a reef 1 foot of fair quality. Ferguson and party are driving in Penhallwick's ground. Wherry and party are still stoping on a good reef from 18 to 20 inches thick. They have about 35 tons broken below. Hauled for the fortnight 16 tons of quartz and the usual amount of water.

CENTRAL EXPLORATION AND INVESTMENT.—The following information with regard to this company's properties has been received from the manager in Western Australia.—Great Tindals Consols, Block 2141. In No. 1 shaft the crosscut has been extended to a total length of 50 feet. The lode should be met with within the next few feet. No. 5 shaft has been sunk a total depth of 33 feet 6 inches, still in formation, which gives very good prospects by the dish both out of the shaft and from the dump.—Block 2164. No. 2 shaft which has been sunk to a depth of 36 feet has been timbered up and drives have been put in a distance of 8 feet to the south and 2 feet the north on a lode formation which is not the main lode. These two levels are being extended upon it before going farther with the crosscut to cut the main body. The water in this shaft is still increasing.—Tindals extended, main shaft. This has been sunk a total depth of 149 feet from the surface. The character of the country passed through is chiefly diorite intermixed with small veins of well-mineralised lode. No. 2 shaft has been sunk 91 feet from the surface. As soon as the 130 feet crosscut is reached it is intended to open out at the 100 feet level.—No. 4 Prospecting shaft. This shaft has been sunk a total depth of 30 feet. The sinking is going on in broken quartz of nice appearance.—No. 3 shaft. About 100 yards south of this shaft the men are prospecting on some nice-looking stone.

WESTRALIA AND EAST EXTENSION.—The following information has been received from the manager at Coolgardie: Prospecting shaft. The enlarging of this shaft is being continued in a very satisfactory manner, and we hope shortly to accomplish its completion, when the sinking of the same will be started with the utmost vigour. This shaft will be sunk in about the middle of our best shoot, from which we expect good results.—Machinery. The milling machinery is arriving at a good rate, and we expect within a few days to commence the excavations for mortar boxes, &c.—Store houses. The new store house is now completed.—Reservoir. Good progress is being made with the excavation of the reservoir.—No. 5 shaft. At a depth of 57 feet a branch 6 inches wide has been intersected, which is probably an offshoot of the Blow lode which we have been in search of. It is very small in comparison to the lode in the Blow shaft. The quartz has a fairly good appearance, but the samples only showed a trace of gold.—No. 1 winze in No. 1 level north of Prospectors' shaft. The reef continues strong and well defined. Assay value 1 ounce 15 dwt.—No. 1 level north of Prospectors' shaft. We have resumed the driving of this level. Assay value 5 dwt.—General. The operations throughout the mine are going on satisfactorily. It must be borne in mind that many of our operations are simply preparatory to driving and sinking on the course of the lode from different points. When these are completed we shall be better able to give you the value of the developments.

WEST RANDT DEVELOPMENT SYNDICATE.—The manager reports: I send you sample of sandstone reef which is being assayed by Mr. A. Van Driel, Government Assayer. We have succeeded in pumping the water out of No. 1 shaft, and are now opening up quartzite reef at 35 feet level. In the westerly drive in No. 1 shaft we are now 6 feet into the reef, which looks very promising, and still shows from 15 to 20 dwt. of gold per ton milling value. I am sinking a shaft 2 feet from the drive so as to reach

OOREGUM.—Mine agent's report for fortnight ending June 1:—Taylor's shaft sunk 10 feet 6 inches, depth below the 960 foot level 34 feet. The lode at this depth is very contracted, only a small streak of quartz, and of no value. The 960 foot level south driven 9 feet 6 inches, total 60 feet. Not being satisfied we were on the main reef a crosscut has been driven west from the end 15 feet; no discovery; therefore suspended, and we are now crosscutting east to prove whether there is any reef in that direction. The 860 foot level south driven 27 feet, total 324 feet 6 inches. Lode 1 foot wide, assay value 2 ounces 5 dwts. 17 grains. No. 1 winze 860 foot level south sunk 1 foot 3 inches, total 31 feet 3 inches. Lode 9 inches wide, assay value 1 ounce 1 dwt. 19 grains. No. 2 winze 860 foot level south sunk 3 feet 6 inches, total 11 feet 6 inches. Lode 6 inches wide, assay value 3 ounces 18 dwts. 9 grains. The 860 foot level north driven 14 feet, total 153 feet. Lode 1 foot 10 inches wide, assay value 8 dwts. 17 grains. No. 1 winze 860 foot level north sunk 2 feet 6 inches, total 17 feet. Lode 1 foot 6 inches wide, assay value 15 dwts. 6 grains. No. 4 winze 660 foot level south sunk 5 feet 6 inches, total 48 feet 6 inches. Lode 6 inches wide, assay value 7 dwts. 15 grains. Level north from back of No. 4 rise 280 foot level south driven 7 feet, total 180 feet 6 inches. Lode 1 foot 3 inches wide, assay value 1 ounce 14 dwts. 20 grains. Wallroth's shaft 4 feet 6 inches, total 1218 feet 9 inches. Lode still small and of no value. The 1060 foot level south driven 14 feet 6 inches, total 354 feet. Lode 6 inches wide, assay value 9 dwts. 19 grains. The No. 1 winze 1060 foot level south sunk 1 foot 9 inches, total 52 feet; no lode. The 1060 foot level north driven 11 feet 9 inches, total 267 feet 3 inches. Lode 6 inches wide; no sample. No. 1 winze 1060 foot level north sunk 4 feet 6 inches, total 62 feet 9 inches; no lode. The 960 foot level north driven 13 feet 6 inches, total 227 feet 6 inches. Lode 3 inches wide, assay value 5 dwts. 10 grains. The 760 foot level north driven 13 feet, total 510 feet 6 inches. Lode 3 inches wide, assay value 6 dwts. 12 grains. No. 3 winze 760 foot level north sunk 5 feet 3 inches, total 14 feet 3 inches. Lode 1 foot wide, assay value 1 ounce 2 dwts. 21 grains. Level north from No. 1 crosscut east 460 foot level south commenced, driven 20 feet 3 inches; at the crosscut the reef was defined and carried a little quartz, it has gradually contracted to the end therefore suspended. The 460 foot level north driven 15 feet, total 389 feet. Lode 6 inches wide, assay value 7 dwts. 15 grains. No. 2 winze 460 foot level north sunk 7 feet 6 inches, total 48 feet. Lode 2 feet wide, assay value 2 ounces 1 dwt. 9 grains. No. 2 winze 360 foot level north sunk 3 feet, total 55 feet 6 inches. Lode pinched, no sample. 215 foot level south driven 20 feet, total 390 feet. Lode very small, and of no value. No. 2 winze 215 foot level south sunk 9 feet, total 24 feet 6 inches. Lode 6 inches wide, assay value 3 dwts. 6 grains. Level south from crosscut east 215 level north driven 3 feet, total 42 feet. Lode 8 inches wide, assay value 2 dwts. 4 grains. At a point near the commencement of this drive, where the lode was the largest, we have been stripping out the quartz, and have discovered another branch about 2 feet east of this reef, which is 6 inches wide, and gave by assay 1 ounce of gold per ton. Low's shaft sunk 3 feet 9 inches, total depth 848 feet 4 inches. The 810 foot level south from point of intersection driven 30 feet 6 inches, total 196 feet. Lode 6 inches wide, assay value 4 dwts. 8 grains. No. 1 winze 810 foot level south from point of intersection sunk 2 feet 3 inches, total 6 feet. Lode 1 foot 6 inches wide, assay value 3 dwts. 6 grains. No. 2 winze 810 foot level south commenced, sunk 2 feet 6 inches. Lode 2 feet wide, assay value 15 dwts. 6 grains. The 810 foot level north from point of intersection driven 23 feet 3 inches, total 111 feet 3 inches. Still in dyke. No. 1 winze 810 foot level north from point of intersection sunk 2 feet, total 10 feet 6 inches. Lode 2 feet wide, assay value 6 dwts. 12 grains. The 710 foot level south driven 13 feet, total 365 feet. Lode 6 inches wide, assay value 4 dwts. 8 grains. No. 2 winze 710 foot level south sunk 5 feet 6 inches, total 57 feet 6 inches. Lode 1 foot 9 inches wide, assay value 3 dwts. 6 grains. No. 3 winze 710 foot level south commenced, sunk 4 feet, lode 2 feet 6 inches, assay value 2 dwts. 4 grains. No. 1 winze 710 foot level south, driven north on lode from point of intersection, sunk 4 feet, total 80 feet 3 inches. Lode 2 feet wide, assay value 5 dwts. 10 grains. The 610 foot level south driven 4 feet 6 inches, total 305 feet 6 inches, no lode. The 510 foot level south driven 6 feet, total 445 feet 6 inches. Lode 6 inches wide, assay value 4 dwts. 8 grains. No. 2 winze 510 foot level south, sunk 6 feet, total 33 feet 3 inches. Lode 9 inches wide, assay value 2 dwts. 4 grains.—Probry's Shaft. The 1150 foot level north driven 16 feet, total 128 feet, lode small and of no value. The 1050 foot level south driven 11 feet 3 inches, total 188 feet. Lode still pinched. The No. 1 winze 1050 foot level south sunk 4 feet, total 51 feet. Lode 9 inches wide, assay value 13 dwts. 2 grains. The 950 foot level south driven 12 feet 6 inches, total 379 feet. Lode also pinched.—Stopes for the month of May, Taylor's shaft. Cutting plats stope 15 fathoms. Back of 760 foot level south stope 2½ fathoms. Lode 3 feet 2 inches wide, assay value 3 ounces 14 dwts. 17 grains. Bottom 660 foot level south stope 13½ fathoms. Lode 2 feet 6 inches wide, assay value 3 ounces 13 dwts. 11 grains. Bottom of 560 foot level south stope 55 fathoms. Lode 2 feet 5 inches wide, assay value 1 ounce 15 dwts. 1 grain. Bottom of 460 foot level south stope 66 fathoms. Lode 2 feet 4 inches wide, assay value 1 ounce 5 dwts. 12 grains. Bottom of level south from back of No. 4 rise 280 foot level south stope 52 fathoms. Lode 1 foot 6 inches wide, assay value 3 ounces 7 dwts. 12 grains. Bottom of level north from back of No. 4 rise 280 foot level south stope 42 fathoms. Lode 2 feet wide, assay value 3 ounces 15 dwts. 5 grains. Back of level south back of No. 4 rise, 280 foot level south stope 9½ fathoms. Lode 1 foot 3 inches wide, assay value 1 ounce 12 dwts. 16 grains.—Wallroth's shaft. Back of 960 foot level south stope 2½ fathoms. Lode 3 inches wide, assay value 4 dwts. 8 grains. Bottom of 860 foot level south stope 5½ fathoms. Lode 2 feet wide, assay value 5 dwts. 10 grains. Bottom of 760 foot level south stope 23½ fathoms. Lode 2 feet 3 inches wide, assay value 2 ounces 11 dwts. 4 grains. Back of 760 foot level south stope 20½ fathoms. Lode 3 inches wide, assay value 1 ounce 2 dwts. 20 grains. Bottom of 660 foot level south stope 14½ fathoms. Lode 1 foot 8 inches wide, assay value 1 ounce 11 dwts. 14 grains. Back of 660 foot level south stope 29½ fathoms. Lode 2 feet wide, assay value 1 ounce 11 dwts. 18 grains. Bottom of 660 foot level north stope 7½ fathoms. Lode 2 feet 3 inches wide, assay value 15 dwts. 8 grains. Bottom of 560 foot level south stope 25½ fathoms. Lode 3 feet 2 inches wide, assay value 1 ounce 6 dwts. 8 grains. Back of 560 foot level south stope 30 fathoms. Lode 1 foot 6 inches wide, assay value 1 ounce 9 dwts. 3 grains. Bottom of 560 foot level north stope 12½ fathoms. Lode 1 foot 9 inches wide, assay value 1 ounce 17 dwts. 23 grains. Bottom of 460 foot level south stope 11½ fathoms. Lode 2 feet 3 inches wide, assay value 19 dwts. 14 grains. Back of 215 foot level south stope 1½ fathom. Lode 6 inches wide, assay value 4 dwts. 8 grains. Bottom of 215 foot level north stope 21½ fathoms. Lode 1 foot 2 inches wide, assay value 17 dwts. 10 grains. Back of 215 foot level north stope 2 fathoms. Lode 1 foot wide, assay value 1 ounce 17 grains.—Low's shaft. Bottom of 710 foot level south stope 5 fathoms. Lode 4 feet 3 inches wide, assay value 2 dwts. 17 grains. Bottom of 610 foot level south stope 13 fathoms. Lode 2 feet 3 inches wide, assay value 4 dwts. 21 grains. Bottom of 510 foot level south stope 7½ fathoms. Lode 1 foot 6 inches wide, assay

value 15 dwts. 6 grains. Bottom of intermediate level north back of 200 foot level south stope 10½ fathoms. Lode 1 foot 10 inches, assay value 10 dwts. 21 grains.—Probry's shaft. Bottom of 850 foot level south stope 6½ fathoms. Lode 1 foot 4 inches wide, assay value 9 dwts. 6 grains. Back of 550 foot level south stope 11½ fathoms. Lode 1 foot 3 inches wide, assay value 8 dwts. 17 grains.—Exploratory work:—Wallroth's shaft. The crosscut west 1060 foot level south further extended 28 feet 3 inches, total 194. No discovery. The crosscut east 760 foot level north extended 10 inches, total 9 feet.—Munday's lode explorations 280 foot level south driven 6 feet 9 inches, total 144 feet 9 inches. Lode 1 foot wide, assay value 2 dwts. 4 grains.—Probry's shaft. The crosscut east from 950 foot level south extended 5 feet, total 80 feet. No discovery; suspended.

SMLTING COMPANY OF AUSTRALIA.—Report of the managing director, dated Monday, May 11: Work was started at the company's property on the shores of Lake Illawarra, New South Wales, about the end of October, 1895. The site upon which to erect the works having been selected, the first thing was to commence grading the top of the hill, and this was taken in hand at once, and completed in the early part of 1896. Excavating for foundations of the several plants was next proceeded with, and we have not completed this work for the blast furnace smelting plant, the desulphurising plant, and for the ore receiving floor, and heavy retaining walls in connection with same have been erected. The extensive grading for the sulphuric acid and precipitating plants is well in hand, and will be completed in about 4 weeks. Sawmill and brick-making plants have been erected, and are in successful operation, the former cutting out timber for the several large buildings to be erected, and the latter turning out bricks for building purposes. The railway line from the junction with the Illawarra Land and Harbour Corporation's line right up to our works is complete, and the site of our future operations is now directly connected by rail with Sydney. The first five large boilers have arrived, and are now in transit between Darling harbour and the works; same will be placed in position at once. Engines and other machinery are on the water, expected within the next week or two, and on arrival will be railed direct to the site of the works and placed. The first two of the several large blast furnaces which will form the smelting plant are in the hands of the manufacturers in Sydney, and one of these is expected to be finished very shortly. Blacksmiths', carpenters', and other workshops, stores, assay offices, general offices, dwelling houses, and other buildings necessary for a large works have been completed as regards some of them, whilst others are nearing completion. In every direction work is being pushed on with as quickly as possible, and satisfactory progress is being made.

TARARU CREEK.—The manager reports under date May 9: Stoping on the California reef in the Norfolk section is progressing as usual. The second and third stope above the intermediate, between the two winzes, have been carried along 87 feet. The reef in these stope averages 3 feet in thickness, is still of a soft clayey or rubby nature, and the ore coming to hand gives good dith prospects of free gold. The 8th and 9th stope above the intermediate east of the rise have been carried along 25 feet. The reef at this point is very large, averaging fully 8 feet in width, and the whole is being forwarded to the battery for treatment. Above the low level on the same reef a stope has been carried along 45 feet east of the second rise. The reef in this stope is 5 feet thick, galena and silicon are well distributed through the ore, and colours of gold are seen in each breaking down. The contractors have extended the Missouri main crosscut 25 feet; this completes their contract of 100 feet, making the total distance driven from the California reef 305 feet. The country in the face is still of a disturbed nature; this work has been discontinued for the present, and a start has been made to drive in a westerly direction on the reef, 120 feet back from the face. Since commencing this work 16 feet have been driven. The reef has opened out to 2 feet thick, and has a nice kindly appearance.—Dunedin section. The present low level on the Day Dawn reef has been extended 17 feet, making the total distance driven on the reef 256 feet. The reef averages 2 feet 6 inches wide, and colours of gold are seen through the hanging wall portion in each breaking down. The tributary level on the same reef has advanced 12 feet, making the total distance driven on the reef at this level 249 feet. The reef in the face is fully 5 feet thick, and is penetrating a good class of sandstone country. This face has been stopped for the present, as the low level will prospect the same ground at a greater depth. The intermediate under the tributary level has been carried forward 34 feet, making the total distance driven on the reef at this level 140 feet. The reef averages 2 feet 6 inches wide, and a fair class of ore is coming to hand. Above this level five stope are in progress, the dirt coming from them is heavily mineralised, and colours of gold are frequently seen in the stone. The drive on the parallel lode from where first intersected has been extended 10 feet, making the total distance driven at this point 64 feet. The reef is 1 foot thick. A rise of 14 feet has been put up on this reef, the back of which is 18 inches thick, and by dish process gives fair prospects of free gold. The drive on the City of Dunedin reef at the low level has advanced a further distance of 41 feet, making the total distance driven on the reef west of the crosscut 518 feet. The reef is still very large, but so far no improvement has taken place. On the eastern side of the crosscut the drive on the reef has been extended 16 feet. The reef in this face shows a width of 3 feet, and is of a brown rubby nature. The drive on the California reef at this level has advanced 34 feet, making the total distance driven on the reef 73 feet. The reef in the face is 3 feet thick, but so far no gold has been seen. Cleaning out and repairing the battery level is now completed, the total length of the tunnel being 1450 feet. A start has now been made to drive in a north-easterly direction on the main reef 200 feet back from the face. This drive is in a distance of 32 feet. The reef is very large. We are carrying 8 feet with us, and there is no appearance of either walls. Some of the stone coming to hand shows galena and silicon freely, and has a nice, kindly appearance. 206 tons of ore have been crushed for a return of 144 ounces 4 dwts. of amalgam squeezed in warm water. Good progress is being made with the erection of the cyanide plant. All the woodwork that is to carry solutions, &c., is perfectly tight and free from leakage. The percolating vats are nearly finished. The sinter towers, tailings, and receiving tank and sumps are completed, and full of water. The addition to the main building is also finished.

PRINCESS ROYAL (Cue).—The mine manager, in his report, dated May 18, states:—Main level south advanced 22 feet, total 69 feet; the stone in the face is still improving. No. 1 shaft main level south advanced 6 feet, total 43 feet; driving is being continued on the footwall, leaving the reef standing. The level north has been advanced 6 feet, total 12 feet; this drive is also on the footwall stone left standing.

TALISMAN.—Extract from consulting engineer's letter dated Coolgardie, May 20: As the mail is closing I cannot enter into a detailed account of progress and development now, reserving this for my next letter. We are straining every effort, however, to finish the battery by end of June. Stoping is actively going on, and the stone maintains its average value, and in some instances the reefs have increased in size. The new chute on the west block is being opened up, and about 100 tons is already at grass.

MOUNT MAGNET.—The following report has been received from the general manager, dated May 11: Mullocks Pass. The winze plat is completed and ground taken down from back north and south of pass to make room for stall preparatory for stoping. The drive is also being prepared for reception of tramroad and trucks.—Auriferous dyke shaft. The drive north is extended to 19 feet, the face carrying 3 feet of quartz that gives excellent prospects. The south drive is 30 feet 6 inches, yield formation material intermixed with small quartz veins, the whole yielding good battery material. We hope shortly to connect with the crosscut west from No. 1 shaft north. This will ventilate the workings and also enable us to remove the rock expeditiously. I propose inviting tenders for the extension of the north drive an additional 50 feet, and should the lode hold productive for this distance, will sink a pass and open up stope forthwith. A portion of the timber for main shaft has arrived, and men are busily engaged preparing sets which will be placed in position as soon as possible. We have the Mason employed quarrying and dressing stone for engine beds, battery buildings, &c. Am preparing the battery site for the reception of machinery.

ALAMILLOS.—Mine report dated June 17: In the 70 fathom level driving east of Sanz' winze the lode is regular and produces stones of lead. The 40 east of Santa Agueda shaft is promising and the lode is strong, valued at 1 ton per fathom. In the 160 west of Taylor's engine shaft no improvement has taken place up to the present. The lode in the 100 east of Judd's engine shaft continues to open out well, and the lode is estimated at 4 tons per fathom. In the sinking of Herman's winze below the 60 the lode has much improved, and is now worth 1 ton per fathom. Marques' winze sinking below the 100 has been suspended owing to an increase of water. Diaz's rise above the 100 fathom level is still opening up stoping ground worth 1 ton per fathom.

CONTINENTAL AND WESTERN AUSTRALIAN TRUST.—Latest mail advices from Mr. Edward Hooper, manager in Western Australia, report that there is a good demand on the part of people engaged in business at Coolgardie for residence at Hampton Town. Bungalows are being erected on the company's blocks at Hampton. The rentals offered show a handsome return on the capital invested.—Coolgardie Town blocks. Purchase of these blocks has been completed. Rentals give a return of from 35 to 50 per cent. annually, with prospect of increase.—Gold mining properties. Two leases have been taken under option at North Coolgardie, on which a shaft 100 feet deep shows very high grade ore, averaging from 3 ounces to over 6 ounces per ton by assay.—Golden Towers leases. It is anticipated that this property will prove exceptionally valuable. Everything is going well. The quartz in the reef Manager is now installed, and mine being vigorously prospected.

DARIEN.—Letter received from Mr. Woakes, dated May 22:—I beg to con-

tin mine to the of
Liskead
being Bassa
Brea to ditto
7s. to
Kitty to 7s.
Me Queen
Que With
all d Ther
daily the
stead busin
and Cons
to r Stock
Foreign note.
lanec real
the d re ra
Chattha poor
quiet Amer
finish bough
take Hom
pronounce flatti
In h owing
the n they
than ever,
on a morni
Amer for yea
Eng York
Defer Sheff
Berwi CAR
Incom ditto Prefe
ditto 2; E Union
Corr Corr
Con Con
Con Con
Three
Cent. For
Six p a-Hai
Cent. BA
obste
yincia
INS
to 1 London
Royal Coa
Ebbw Camm
TEL Defe
BRIT 1;
Mis Coat's
Manch Spira
Cuar Union
Mes Hanov June
home Caledo
Merca 21 to 1
South 229.
G. W. 63s. E
24 11 Distill
Many Nobels
12, Wi

The London
(Limit The
(LIMI The
Am preparing the battery site for the reception of machinery.

PROVINCIAL SHARE MARKETS.

THE CORNISH MINE SHARE MARKET.

Mr. MICHAEL WILLIAMS BAWDEN, Mining and Assaying Offices, Liskeard, Cornwall, writes (June 25):—The mining share market has not been so firm during the week on the price of tin and copper being easier, and the amount of business limited. Quotations:—Basset United, 18s. 6d. to 20s.; ditto (5s. paid), 4s. 6d. to 5s.; Carn Brea and Tincroft United (£1 paid), 20s. to 21s. 6d.; ditto, 2s. 6d. to 3s.; Devon Consols, 19s. to 20s.; Dolcoath, 16s. to 18s. 6d.; ditto (7s. 6d. paid), 5s. to 5s. 6d.; East Pool, 2s. to 2s.; Killifreth, 7s. to 7s. 6d.; Levant, 4 to 4s.; Polberro, 8s. 6d. to 9s.; West Kitty, 2s. to 2s.; Wheal Grenville, 6s. to 6s.; Wheal Kitty, c.p., 6s. to 7s.

Messrs. ABBOTT and WICKETT, Stock and Share Brokers and Mining Share Dealers, Redruth, write under date of June 25:—Although the amount of business in the mining market has not been large, there is a much better tone apparent. The chief enquiry has been for Dolcoath, West Kitty, and Wheal Grenvilles, but shares in all three are scarce at present quotations. Quotations herewith:—Blue Hills, 1s. to 2s.; Basset Mines, 1s. to 1s.; Carn Brea, 1s. to 1s.; Dolcoath (fully paid), 16s. 6d. to 17s. 6d.; ditto (7s. 6d. paid), 5s. to 6s. 6d.; East Pool, 2s. to 3s.; Killifreth, 6s. to 8s.; Polberro, 4 to 4s.; South Crofty, 1s. to 1s.; Tincroft, 8s. to 9s.; West Kitty, 2s. to 3s.; Wheal Grenville, 6s. to 6s.; Wheal Kitty, 1s. to 2s.; Wheal Metal (3s. paid), 3s. 6d. to 4s.

MANCHESTER.

Messrs. JOSEPH R. and W. P. BAINES, Stock and Share Brokers, Queen's Chambers, 7, Market street, write June 25 (noon):—With one or two slight exceptions in home rails, railway stocks in all departments show a very general decline for the past week. There have been some fluctuations, which will be referred to in the daily details, but these apart we need only say that in most cases the latest prices are rather above the worst. Figures dropped steadily with the approach of the settlement, but on resumption of business for the "new go," a fair number of rallies were recorded, and these are mostly maintained down to time of writing above. Consols quote 2s. down on the week. Colonials show no changes to report, and the few alterations in Home Corporation Stocks are yet on the side of appreciation in values. Foreigners mostly lower, without, however, any serious declines to note. Further classes of shares down to and including "Miscellaneous" proper show very irregular movements, and but few of real consequence as regards amount. These will be readily seen in the details of changes hereunder. Turning now to the daily details re rails. On Friday last home rails moved contradictorily, with Chathams to the fore in the small business doing. Americans began poorly, but mended as the day wore on. Saturday saw home rails quiet, but figures, where altered, were rather on the better side. Americans, after an appearance of steadiness at the beginning, finished rather weaker. On Monday, most people who had bought during the account and saw a profit tried to take it, hence prices were put down in all directions. Home rails shared in this movement, but it was more pronounced in mines and American railways. Tuesday was a flatish market in most departments on the eve of the settlement. In home rails the fall was very general with Chathams a specialty, owing to adverse criticism of prospects of ordinary in the light of the new arrangements. In Americans there are a few declines, but they are small in any case. Yesterday (carrying-over day in other than mines) found better prices the rule for new time, with, however, exception as regards Americans. Grand Trunk issues improved on a traffic announcement rather ahead of anticipation. This morning prices generally are much the same as last night's close, but Americans are better in several cases in response to better figures for yesterday in New York.

ENGLISH RAILS.—Higher: Great Eastern, 1s.; Lancashire and Yorkshire, 1s.; Lower: Caledonian, 1s.; ditto, Deferred, 1s.; York Deferred, 1s.; Great Western, 1s.; Brighton A, 1s.; Chathams, 1s. to 1s.; Sheffield A, 1s.; Districts, 1s.; Midlands, 1s. to 1s.; North British, 1s.; Berwicks, 1s.; Dover A, 1s.

CANADIANS AND AMERICANS.—Lower: Atchison, 1s.; ditto Income Bonds, 1s.; Canadian Pacifics, 1s.; Trunk Ordinary, 1s.-1s.; ditto Guaranteed, 1s.; ditto First Preference, 1s.; ditto Second Preference, 1s.; Central Pacific, 1s.; Milwaukees, 1s.; Denver, 1s.; ditto Preference, 1s. to 1s.; Louisville, 1s.; New York Central, 1s.; Erie, 1s.; Ontario, 1s.; Norfolk Preference, 1s.; Readings, 1s.; Union Pacifics, 1s.

CONSOLS.—Lower: Two and Three-quarter per Cent., 1s.

COLONIAL STOCKS, &c.—Unchanged.

CORPORATION STOCKS AND DEBENTURES.—Higher: Glasgow Three and a-half per Cent., 2s.; Runcorn Three and a Quarter per Cent., 1s.

FOREIGNERS.—Higher: Egyptian Unified, 1s.; Lower: Argentine Six per Cent., 1s.; Argentine Five per Cent., 1s.; Brazilian Four and a-Half per Cent., 1s.; Brazilian Four per Cent., 1s.; Spanish Four per Cent., 1s.; Uruguay Three and a-Half per Cent., 1s.

BANKS.—Higher: Adelphi, 1s.; London and Midland, 1s.; Manchester and County, 1s.; Mercantile of Lancashire, 1s.; National Provincial, 1s.; Lower: Bank of Liverpool, 1s.; Imperial Ottoman, 1s.

INSURANCE.—Higher: British and Foreign Marine, 1s.; Guardian, 1s. to 1s.; Ocean Marine, 1s.; Lower: Commercial Union, 1s.; Liverpool, London, and Globe, 1s.; London and Lancashire, 1s.; Palatine, 1s.-1s.; Royal, 1s.; Thames and Mersey, 1s.-1s.

COAL, IRON, &c.—Bolckow Vaughan, £20 paid, 1s.-1s. to 3s.-1s.; Ebb Vale, 5s.-1s.; Sheepbridge "A," 1s.; Lower: John Browns, 1s.; Cammells, 1s.

TELEGRAPHES AND TELEPHONES.—Higher: Anglo-American Deferred, 1s.; Direct United States Cable, 1s.

BREWERS.—Higher: Guinness, 20; Tiplin's, 1s.; Lower: Bent's, 1s.; Boddington's, 1s.; Parker's, 1s. to 1s.; Threlfall's, 1s.

MISCELLANEOUS.—Higher: Brunner Mond, 1s.; Chadwick's, 1s.; Coats', 1s. to 1s.; Hetherington's, 1s. to 1s.; Keilner Partington, 1s.; Manchester Carriage A, 1s.; Manchester Palace of Varieties, 1s.; Spies and Pond, 1s.; Gas Light A, 3 to 4.—Lower: Bodegas, 1s.; Cenard Steam, 1s.; Eastman's, 1s.; Manchester Tramways, 2s.; Salt Union, 1s.-1s.; Ship Canal Ordinary, 1s.-1s.; ditto Preferences, 1s.-1s.

LATER (4 p.m.)—Home rails distinctly better to-day, some of them being 2 per cent. higher. Americans also better, but Canadians only small, whilst Mexicans are practically unaltered.

EDINBURGH.

Messrs. THOMAS MILLER and SONS, Stock and Share Brokers, 69, Hanover-street, Edinburgh, report as follows under date of June 25:—Since last week's report there has been little activity in home railway stocks, ordinary or preference. In insurance shares, Caledonian, English and Scottish Law Life, and North British and Mercantile are all higher. Clydesdale Bank shares have risen from 2s. to 2s. 6d., National from 3s. 6d. to 3s. 6d., Royal from 2s. 6d. to 2s. 6d. Steel Company of Scotland shares have changed from 5s. to 5s.; Wilsons and Clyde Coal from 8 to 8s.; Arizona from 6s. 3d. to 6s. 6d.; Broken Hill from 5s. to 5s. 6d.; Rio Tinto from 2s. 6d. to 2s. 11s.-12s.; Broxburn Oil from 9s. to 9s. 6d.; Hermand Oil from 2s. to 1s. 9d. Distillers have declined from 2s. 6d. to 2s. 1s.-1s. J. and P. Coats, after many fluctuations, stand at 5s. 6d., as compared with 5s. 6d. a week ago. Nobels have advanced from 1s. 13s.-16s. to 1s. 17s.; J. A. Weir from 11s. to 12s.; Widnells from 12s. to 12s. 6d.

THE Anglo-French Colonial Mining Trust have been appointed London agents to the Buffelskloof Gold Mining Company (Limited).

The secretary of the ISLE OF MAN MINING COMPANY (LIMITED) has sold 100 tons of the company's ore at £8 9s. per ton.

BRITISH GUIANA'S GOLD INDUSTRY.

The following is the amount of gold shipped by the R.M.S. *Eden*, which left Georgetown on Tuesday, June 9, and the names of the shippers:—

	Ozs. dwt. grs.	Total Value
Colonial Bank	1347 2 9	
British Guiana Bank	4472 17 22	
Total	5819 19 21	\$103,937.89

The returns of gold entered at the Department of Mines are as follows:—

	May 23.	May 30.
Ozs. dwt. grs.	Ozs. dwt. grs.	Ozs. dwt. grs.
Barama...	209 6 21	161 1 6
Barima...	1645 17 0	312 14 20
Cuyuni...	629 10 8	593 16 14
Demerara...	—	8 5 13
Esequibo...	553 3 20	803 0 0
Groote Creek...	23 1 13	26 15 10
Mazaruni...	—	136 10 9
Potaro...	250 6 20	344 18 4
Paruni...	87 3 23	256 9 2
Total...	3398 10 9	2598 11 6
Export of gold from January 1 to June 8:—		
Ozs. dwt. grs.		
1896 43,214 7 19 at \$769,744.00		
1895 46,708 1 11 at \$827,131.56		

THE GERMAN IRON INDUSTRY.—The output of pig iron during May of the works belonging to the South-Western Branch of the German Iron and Steel Association was as follows:—Puddling pigs, 24,436 tons, against 26,242 tons in April; Thomas pigs, 65,619 tons, against 63,500 tons; foundry ditto, 11,454 tons, against 10,094 tons—total 101,509 tons, against 99,536 tons. The May total last year was 96,460, against 93,378 tons for April. The total for the five months this year is 497,496 tons, against 463,989 tons a year ago. These monthly figures show an increase of 1673 tons, or 1.7 per cent. compared with April; and of 5649 tons, or 5.2 per cent., as compared with May last year. During the five months the output has increased 33,507 tons, or 7.2 per cent.

PUBLICATIONS.

JUST PUBLISHED. JUNE, 1896.

THE

MINING MANUAL for 1896,

By WALTER R. SKINNER.

CONTAINING OVER

1300 Pages of Matter in Four Sections, viz.:—
AUSTRALASIAN MINING COMPANIES, MISCELLANEOUS MINING COMPANIES, SOUTH AFRICAN MINING COMPANIES, MINING DIRECTORS.

EIGHTH YEAR OF PUBLICATION.

THE MINING MANUAL for 1896 deals with 2712 Companies, of which 810 are Australasian, 922 are South African, and 980 are Miscellaneous.

The particulars given of each Mining Company include the directors and other officials; date of establishment; seat of operations; description of the property, with the purchase consideration; details of capital; calls; dividends paid; and the financial position as disclosed by the accounts, with extracts from the latest directors' reports.

Special attention has been given in this issue to West Australian Mining Companies, the particulars of these containing, in addition to above, extracts from the prospectus issued by each company.

THE MINING MANUAL FOR 1896,

In Demy 8vo., Cloth, 1356 pages.

PRICE 15s., POST FREE.

London:

26, NICHOLAS LANE, LOMBARD STREET, E.C.

THE LIXIVIATION OF SILVER ORES

WITH HYPOSULPHITE SOLUTIONS.

By C. A. STETFELDT.

SECOND EDITION. COMPLETELY REVISED.

With Two Plates showing Construction of a LIXIVIATION PLANT. Published and Sold in the United States and Mexico by the Author 967, ALICE STREET, OAKLAND, CALIFORNIA.

Price, bound in Cloth, \$5.

For all other countries the Sale is conducted by CRAZ and GERLACH (Joh. Stettner), Freiberg in Sachsen, Germany. Price 20s. net.

WORKS ON MINING, METALLURGY, and ALLIED SUBJECTS.

A Hand-Book of Gold Milling. By HENRY LOUIS, A.R.S.M., F.G.S., &c. Crown 8vo., 10s. net.

The Golden Quartz Reefs of Australia. By WILLIAM NICHOLAS, F.G.S., with Illustrations. A series of Articles especially relating to the Bendigo Gold Field, Victoria. 2s., Post Free.

A New Guide to the Iron Trade, or Mill Managers' and Stock Takers' Assistant. By JAMES ROSE, of Batman's Hill Iron-Works. Second Edition. Comprising a Series of New and Comprehensive Tables, practically arranged to show at one view the Weight of Iron required to produce Boiler Plates, Sheet Iron, and Flat, Square, and Round Bars, as well as Hoop or Strip Iron of any dimensions, to which is added a variety of Tables for the convenience of Merchants, including Russian Table. 8s. 6d.

The Colliery Ready-Reckoner and Wages Calculator. By JAMES IRELAND. 1s. 6d., Post Free.

Tacknote: a Form of Licence to Explore and Search for Mines. Minerals, &c. 1s., Post Free.

Notes on the Philippine Islands: A Pamphlet Reprint. By FRANK KARUTH, F.R.G.S. 6d.

History of the Holmbush, Redmoor, and Kelly Bray Mines: with Several Sections of the Workings. By W. F. WILKINSON, 1s.

The Law of Merchandise Marks. By FRANK SAFFORD. Recorder of Canterbury, and a Member of the London Chamber of Commerce. 7s. 6d.

LONDON:

THE MINING JOURNAL,

18, FINCH LANE, E.C., and

3, DORSET BUILDINGS, SALISBURY SQUARE, E.C.

WANTED.

** Prepaid Advertisements are inserted in this column at the rate of 8d. per line, with a minimum charge of 4s.

L. LePersonne and Co., London.

Telephone, No. 15,144. Telegraphic Address: "LePersonne, London."

Codes, A.B.C., MACNEIL, MORRISON.

MINERAL, METAL, IRON AND TIN PLATE MERCHANTS AND BROKERS.

Contracts negotiated. Buying or Selling Agencies solicited.

Zinc, Lead, Silver Lead, and Copper Ores offered specially invited.

XPERIENCED AGENTS appointed in the COLONIES and FOREIGN MARKETS where not represented.

ARSENICAL ORES AND MATERIAL.

SELLERS are INVITED to COMMUNICATE with W. BEVAN & CO., Arsenic Manufacturers, Swansea.

A GENTLEMAN, with several years experience in South Africa, Mashonaland, intends returning there next month. Would TAKE MANAGEMENT of Prospecting Syndicate or Shooting Trip. Dutch and Kafir spoken. Practical prospecting, good shot and rider. References. Address "Z," Box 301, WILLING'S, 125, Strand, London, W.C.

WANTED, for GOLD MINES in INDIA, an ASSAYER, and also an ASSISTANT MILLMAN.

Application to be made in writing, with copies of testimonials, state of age, experience, and salary required, to "SECRETARY," care of STREET and CO., 30, Cornhill, E.C.

WANTED, an experienced MINING ENGINEER or CAPTAIN for Asphaltum Mines in Barbados, West Indies.

Apply to WALTER MERRIVALE, Esq., Bridgetown, Barbados, West Indies.

WANTED, for an INDIAN COLLERY, ASSISTANT FIRST-CLASS CERTIFIED COLLERY MANAGER, one who has been accustomed to work very thick and steep seams. Must not be over 30 years

BLACK REEF AT NATAL SPRUIT.

AT the ordinary meeting of the South African Geological Society, held last month, the following communication from Mr. Geo. D. Stonestreet, A.I.M.E., was read by Mr. Harger:—

In Messrs. Hatch and Chalmers' recent work on "The Gold Mines of the Rand," and on page 14, they say: "To the south of the Black Reef lies a broad expanse of flats and swamps, some eighteen or twenty miles broad. Here the rocks are buried beneath deep surface deposits, and but little is known of the solid formation." As the writer has been engaged for the past fourteen months in drilling and shaft-sinking in a portion of this unknown territory, he ventures to place a few results of his experiences before you. Starting at the Orion Gold Mining Company (which is not an outcrop company, though close to it), the outcrop of this reef strikes in an easterly direction through the properties of the Meyer and Leeb, East Orion, H. Eckstein & Co., &c., and can be easily traced a distance of five miles, where it seems to be lost for a long distance. It will be probably found much further north. West of the Orion Company the outcrop takes a southerly course for about a mile, and from this point continues on its general westerly course. The dip is usually south, or a little east of south, but, for local reasons, the dip on one property may take several directions. The rate of dip is from five to ten feet per hundred. The Black Reef has been laid down upon an igneous rock of amygdaloidal character, which reaches down to the Elsburg series, and is several thousand feet in thickness. The amygdaloid can be found outcropping north of the Eckstein property all the way to the Elsburg series. In a borehole recently put down by the Orion Company on their property no change of any consequence was met with to a depth of 2,300 feet, and, at the point of boring, another 1,500 feet would probably have to be added as the total vertical distance from the Black Reef to the Elsburg series. When this igneous rock was laid down its surface was of a most uneven character, undulating in immense rolls, or waves, of 300 to 400 feet from crest to crest, and the direction of its origin was probably from the north. These rolls usually exist in an east and west direction, and are from 50 to 200 feet in height above the troughs, but their length in a continuous sense is probably small. It was upon this uneven surface that the blanket was laid down, and its thickness and quality much affected by reason of it; for the thickness runs from 14 feet to nothing, and its quality from a trace to a hundred of ounces per ton. What are known locally as shoots seem to be the troughs of the undulations where the reef was deposited, and particularly such portions of it which were accessible to the liquid solutions carrying gold. It is only upon the crests that the reef is entirely absent, and in some places even where the blanket was deposited the gold solutions failed to reach it owing to difference of elevation. Herein seems to be the difference between the Black Reef and other series, these last being laid down and mineralised in a horizontal position, and the former, of a much more recent date, laid down and mineralised upon an undulating, uneven bed. The reef itself is of the usual blanket or conglomerate type, differing from the Main and other reefs in the size of its pebbles, these being small, and in its footwall it contains sparsely-scattered, large angular pebbles. The mineralisation is greatest in the lower six inches, and below this occurs the well-known ferruginous clay which carries so high a value. As vertical depth is gained this clay changes to slate, highly mineralised and of good value. The hanging wall is always quartzite, which varies in thickness from 16 to 100 feet. The quartzite evidently filled up all of the previous uneven surface, for where the quartzite is thin there is no reef, and vice versa. Above the quartzite is found magnesian limestone, varying in thickness from one foot to 600, as distance from the outcrop make the difference. Above this limestone occurs cherts, with some manganeseiferous ore, this deposit being from 30 to 60 feet. Over this exists a decomposed rock, evidently of igneous origin, and probably a diorite, this being from 20 to 90 feet thick; and, lastly, the gravel and usual red soil, about 10 feet thick. While the above is the invariable order of the strata, certain occurrences at different points are worthy of note. Graphite in an almost pure state, but of limited quantity, has been met with in the reef itself at the Orion Company and in the limestone in the shaft of the Black Reef Proprietary Company. In an area south of this last-named Company there is a remarkable dyke showing on the surface for over three miles. This dyke consists of syenite, and has evidently come up from below the Main Reef series, but exactly which this vertical distance may be it is, of course, impossible to say. The course of this dyke is north 15 degrees west, and it seems to have its northern end in the property of the East Orion Company, where the evidences of its intrusion after the reef was laid down are seen in the disturbance of the dip. The width on the surface is 60 feet. About nine miles south of the Orion Company the reef has been located and opened by the writer, and here similar conditions exist as on the northern outcrop. The dip on the southern outcrop is to the north, so that this former *terra incognita* is now pretty well known, and the boundaries of this reef basin clearly defined. Many boreholes have recently been put down in this vicinity, and it is upon the results of these and deep shaft-sinking that the conclusions noted are arrived at. These boreholes have given more or less satisfactory results, but it is the opinion of the writer that they should not be used for prospecting on this reef except to prove the formation. Two holes put down within 200 yards of each other gave unexpected results. The first found the reef, and the second did not, because it struck the crest of a wave or undulation where the reef does not exist. Should owners of ground desire to know the value of their property, a shaft should be put down, and then, if the reef is not found, driving on the footwall of the quartzite will develop it, probably within 300 feet of the shaft. It is by this means only that the payable shoots will be found. In sinking shafts ample allowance should be made for water, which in one shaft gave a flow of 30,000 gallons per hour, but this water is contained in reservoirs near the surface, and does not give much trouble below the limestone. In the shaft referred to, the water has been reduced to 4,000 gallons per hour. As this reef and the manner of its deposition seems to be but little understood, it is hoped that these few notes may lead to its better appreciation as a mining proposition.

Mr. DRAPER said he had some further information to impart regarding the dyke referred to by Mr. Stonestreet. He had sent a sample home to Professor Judd to be examined, and that gentleman informed him that it was "*Algerine lamprophyre syenite vogesite*." (Laughter.)

It was suggested that Mr. Draper, having gone so far as to repeat the terms, should now translate them, which that gentleman, amid considerable merriment, prudently declined to attempt.

Dr. Exton announced that on this paper, too, the discussion would take place at the following meeting.

The meeting then adjourned.

RUSTLESS COATING FOR IRON AND STEEL.—A rustless coating for iron and steel adopted in France consists in forming on the metal surface a double carbide of hydrogen and iron, which is said to be extremely hard adhesive. The treatment is effected in a pair of gas retorts, set side by side, and raised to a temperature of from 600 to 700° C. The articles in this case are placed in a retort for about 20 minutes, when a current of hydrogen is turned into the retort and kept on for 45 minutes, small quantity of naphtha being now introduced, the supply of which is kept on for 10 minutes. The naphtha is then shut off, and a current of hydrogen is turned on for 15 minutes longer, when the process is finished. All that remains is to cool the retorts down to 100° C., after which the retort lids may be taken off and the product removed. The coating thus produced has a bluish colour, and is stated to be so adherent to the metal that a treated bar can be bent through an angle of 45° without disturbing it.

COAL MINING IN RUSSIA.—From the mines in the Donets district of the recently-formed Prokhorov Coal Mining Company no less than 1,726,608 pounds of coal were extracted during January last, as compared with only 1,292,040 pounds in December last.

MINING IN TURKEY.—A report is being prepared by the Turkish Ministry of Agriculture, Mines and Forest, giving complete and detailed statistics of the mining enterprises in the country.

The first batch of letters of allotment and regret to applicants for shares in the LONDON AND BRITISH COLUMBIA GOLD FIELDS (LIMITED) have been posted.

THE UNITED ASBESTOS CO. (Limited), DOCK HOUSE, BILLITER STREET, LONDON, E.C.

PIONEERS of the ASBESTOS Trade. The ONLY COMPANY in the WORLD owning and working Asbestos Mines both in ITALY and CANADA. All goods are made at our Works, near London, and are of the best possible description.

SPECIFY "SALAMANDER" BRAND.
Depots: NEWCASTLE-ON-TYNE, Quay Side; MANCHESTER, 34, Deansgate; LIVERPOOL, 33, James Street; GLASGOW, 93, Bothwell Street; CARDIFF, 135, Bute Street; BRISTOL, Provident Buildings, Clare Street; ST. PETERSBURG, Gostino Dvor (interior), No. 51; ANTWERP, Rue Montevideo.

THE UNITED ASBESTOS PATENT "SALAMANDER" DECORATIONS.

PRICES ON APPLICATION

"CHAMPION" ROCK DRILLS

Have all the latest improvements resulting from 19 years' practical experience in constant work.

Unrivalled for efficiency and durability in Sinking Shafts, Driving Levels & Tunnels.



THE CHAMPION ROCK-BORER AND AIR COMPRESSOR CO.

SOLE PROPRIETORS AND MANUFACTURERS,

E. P. and H. P. VACHER.

MAKERS OF ROCK DRILLS, AIR COMPRESSORS,

TURBINES, WATER WHEELS, WATER MOTORS, RAMS

AND OTHERS

MINING MACHINERY.
63, Queen Victoria Street,
LONDON, E.C.

Telegraphic Address: "TURNSCREW, LONDON."

SHIPPING.

CASTLE LINE.—CAPE & NATAL MAILS.

WEEKLY SERVICE FOR THE GOLD FIELDS OF SOUTH AFRICA.—The CASTLE COMPANY'S STEAMERS leave LONDON (East India Dock Basin, Blackwall) every FRIDAY, and sail from SOUTHAMPTON every SATURDAY.

Steamers.	London.	Southampton.
Arundel Castle (via Canaries) ...	July 3	July 4
Hawarden Castle (via Madeira) ...	July 10	July 11
Methven Castle (via Canaries and St. Helena) ...	July 17	July 18
Tantal on Castle (via Madiera) ...	July 24	July 25

* Also for Madagascar and Mauritius.

Return tickets to all Ports.

Free Tickets by Castle Express from Waterloo to Southampton.

Apply to DONALD CURRIE and Co., 3, Fenchurch Street

London, E.C.

West End Agency, THOS. COOK AND SON, 13, Cockspur Street.

UNION LINE.

FOR SOUTH AFRICAN GOLD FIELDS.—WEEKLY SERVICE.—CAPE OF GOOD HOPE, NATAL, and EAST AFRICAN ROYAL MAIL STEAMERS.—THE UNION STEAMSHIP COMPANY'S ROYAL MAIL and INTERMEDIATE STEAMERS will sail as follows for SOUTH and EAST AFRICA, calling at MADEIRA and TENERIFFE.

Steamers.	Antwerp.	Rotterdam.	Hamburg.	Southampton.
Moer ...	June 30		July 4	July 4
Frogn ...			July 11	July 11
Boat (twin screw) ...			July 18	July 18

* Calling at Madeira.

† Via Teneriffe.

Free railway tickets from London and Plymouth to Southampton.

Cheap Tickets are issued for Passengers' Friends. The Union Line Express is despatched from Waterloo Station (Main Line Platform) every Saturday.

RETURN TICKETS ISSUED.

Apply to the UNION STEAMSHIP COMPANY (LIMITED), CANUTE ROAD, SOUTHAMPTON; 14, COCKSPUR STREET, LONDON, S.W.; and SOUTH AFRICAN HOUSE, 94 to 96, BISHOPSGATE STREET WITHIN, LONDON, E.C.



CHEAP TRANSPORT.

BY IMPROVED
AERIAL WIRE
ROPEWAYS.
(See and Beddington Patents.)



Advantages over other Systems:—

Economy in Cost and Working. Simplicity of Construction with High-Class Material. Long Spans and Steep Gradients Overcome. Reduced Wear of Cables, and Few Supports.

Estimates, Pamphlets, & full Particulars on Application to the PROPRIETORS OF THE PATENTS:

ROPEWAYS SYNDICATE, LIMITED.
150, LEADENHALL STREET, LONDON, E.C.
TELEGRAMS: "ROPEWAYS, LONDON."

TURBINES. FACTS!

Unlike other Turbines, with from 12 to 24 water inlets to supply it with water, our LITTLE GIANT Wheel has one Vertical Gate only, so that no waste of water, power, and no stoppages takes place owing to small rubbish lodging in the gates as in other types of turbines.

FULL PARTICULARS SENT FREE.

S. HOWES, HYDRAULIC ENGINEER.
64, MARK LANE, LONDON,
AND AT SILVER CREEK, N.Y., U.S.A. E.C.

ONLY GOLD MEDAL FOR ALLOYS, INVENTIONS EXHIBITION.

"PHOSPHOR-BRONZE." (Cog Wheel Brand)

The Best Alloys for all Wearing parts of Machinery, Bearings, &c.

BEWARE OF ALL IMITATIONS, & SPECIFY THE COMPANY'S MAKE.

BULL'S METAL, Ingots, Forgings, Castings, Stampings, Rods and Sheet.

The Phosphor Bronze Company (LIMITED).

87, SUMNER STREET, SOUTHWARK,
LONDON, S.E.

AUSTRALIAN MINERALS.

COLLECTIONS of AUSTRALIAN MINERALS for Show Case or for technical purposes supplied to order. Price from £2 2s upwards. On receipt of order with remittance a collection will be made up and despatched without delay.

MINES REPORTED ON.
J. B. AUSTIN, Mineralogist, Adelaide, S.A.

BUSINESS CARDS.**AERIAL ROPEWAYS.**

OTTO SYSTEM.

R. E. COMMANS (late Commans and Co.), 6, Queen Street Place, London, E.C.

ASBESTOS.

THE UNITED ASBESTOS COMPANY (Limited), Dock House, Billiter Street, London, E.C. Asbestos Goods of the highest quality.

EXPLOSIVES FOR MINING.

NOBEL'S EXPLOSIVES COMPANY (Limited), Glasgow. Manufacturers of Gelignite, Gelatine - Dynamite, Dynamite, Detonators, Electric Detonator Fuses, &c., &c.

MAGNETIC ORE SEPARATORS

(KING'S PATENT).

FOR SEPARATING IRON ORE FROM OTHER MINERALS. Apply, FREDK. J. KING, 96, Leadenhall Street, London.

METAL PERFORATORS, &c.

J. & F. POOL,

METAL PERFORATORS & WIRE WEAVERS. COPPERHOUSE, HAYLE, CORNWALL.

SPECIALITIES:—All descriptions of Perforated Metal Plates, Stamps' Battery-Screens, Wire Gauze and Sieves for Foreign and Home Mining, and other Purposes. Export orders carefully and promptly executed.

MINING ENGINEERS.

F. M. KRAUSE, F.G.S., F.L.S., (formerly of the Geological Survey of Victoria, late Professor of Geology and Mining at the School of Mines, Ballarat), Examines and Reports upon Mines and Mineral Lands. May be consulted by Shareholders and intending Investors in Australian Mining Properties. 18, Temple Court, Collins' Street, Melbourne, Victoria, Australia.

F. H. MASON, F.C.S., Metallurgist, Assayer, and Analytical Chemist. Refactory gold ores a speciality. Can be consulted with reference to Nova Scotian properties. Queen Buildings, Halifax, Nova Scotia. Cable address: Mason, Halifax. (Moreing's code).

MINING INSTRUMENTS.

JOHN DAVIS & SON, All Saint's Works, Derby; and 118, Newgate Street, London. Mathematical instruments and miner's safety lamps.

MINING MACHINERY.

FRASER & CHALMERS (Limited), 43, Threadneedle Street, London, E.C. Mining machinery of the most approved design.

THOMAS LARMUTH and CO., Salford, Manchester. Manufacturers of Patent "Hirnant" Plant, Rock Drills, Air Compressors, Sinking Carriages, &c. Agents for South Africa—Messrs. REUNERT and LENZ, Johannesburg.

ROBEY & CO. (LIMITED), Manufacturers of Steam Engines, Mining Machinery, &c. Makers of the Robey Patent Automatic Expansion Gear.—Globe Works, Lincoln.

GATES IRON WORKS, 73A, Queen Victoria Street, E.C. The Gates Rock and Ore Breaker effects a great saving in power.

ORE DRESSING MACHINERY.

THE LÜHRIG COAL AND ORE DRESSING APPLIANCES (LIMITED), 32, VICTORIA STREET, LONDON, S.W.

COMPLETE DRESSING PLANTS for Gold, Silver, Lead, and Copper Ores, &c., designed and erected, LÜHRIG SINGLE AND COMPOUND VANNERS for Low Grade Ores and Tailings, IMPROVED BREAKERS, ROLLS, JIGS, and SEPARATING DRUMS. Tests made with Samples at London Works Free of Charge.

ORE REDUCTION.

THE CLARKSON-STANFIELD ORE REDUCTION COMPANY (Limited). Process for the treatment of gold, silver, copper, lead, and other ores. Address, 6, Colonial Avenue, Minories, London, E.

ROCK DRILLS.

RICHARD SCHRAM & CO., 17a, Great George Street, Westminster, S.W.

SAFETY FUSE MANUFACTURERS.

THE UNITY SAFETY FUSE CO., Scorrier, Cornwall. Manufacturers of all kinds of Safety Fuse for use in Mining, Quarrying, Submarine, and other Blasting Operations.

STONEBREAKING MACHINERY.

W. H. BAXTER, Engineer, Leeds. Stone-breaking and Ore-crushing Machinery. All highest awards received for 12 years. Guaranteed for economy in power, efficiency and durability over all others. Catalogues free.

TUBE MAKER.

GEO. J. CHATTERTON, manufacturer of lead pipe, block tin pipe, and tinned composition gas tube, Caledonian Road, London, N.

THE VICTORIAN GOLD FIELDS (LIMITED),

21 and 22, COPTHALL HOUSE, COPTHALL AVENUE, E.C.

This company, having made arrangements with well-known experts in Australia, is now prepared to provide reports on Mining Properties in any of the Australian Colonies and New Zealand at moderate cost.

Terms can be had and testimonials of experts seen at above Office.

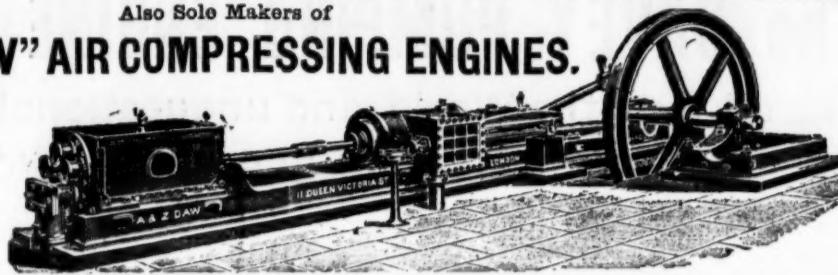
A. & Z. DAW,

11, QUEEN VICTORIA STREET, LONDON, E.C.

Patentees and Sole Manufacturers of

THE "DAW" ROCK DRILLS,
QUARRY BARS & TRIPODS, & IMPROVED TUNNEL COLUMNS.

Also Sole Makers of

THE "DAW" AIR COMPRESSING ENGINES.

Highest
Award
and
Medal,
World's
Fair,
Chicago,
1893.

Estimates for Rock Boring Plant and General Mining Machinery on Application.

Registered Telegraphic Address: "GULDNES, LONDON." Al. A.B.C. 4th Edition, and Moreing and Neil's Codes used.

CONTRACTS FOR ALL KINDS OF ROCK DRILLING UNDERTAKEN.**BOURDON'S TRADE GAUGES.**E. BOURDON
Inventor & Manufacturer**NEGRETTI AND ZAMBRA,**

SOLE AGENTS IN LONDON.

M. BOURDON cautions persons using Steam Gauges that a large number of very inferior instruments are sold, bearing his name, which are not of his manufacture, a great proportion of them also having a forged Trade Mark.

Only GOLD MEDAL for GAUGES at Paris Exhibition, 1878.

NEGRETTI and ZAMBRA are now in a position to supply Admiralty Gauges of the Latest Pattern. PRICE LIST FREE ON APPLICATION.

Negretti and Zambra,
SCIENTIFIC INSTRUMENT MAKERS TO HER MAJESTY, AND BRITISH AND FOREIGN GOVERNMENTS.

THEODOLITES, LEVELS, CIRCUMFERENTIALS, MINERS' DIALS, COMPASSES, DRAWING INSTRUMENTS, LEVELLING STAVES, BAROMETERS, THERMOMETERS, AIR METERS, BINOCULARS, TELESCOPES, &c., &c.

Illustrated Price Lists & Estimates Post Free to all Parts of the World

38, HOLBORN VIADUCT.

BRANCHES: 45, CORNHILL, AND 122, REGENT STREET, LONDON.

**TONITE**

IS RECOMMENDED TO CONTRACTORS, MINERS, PIT SINKERS, QUARRYMEN, AND OTHERS, AS BEING THE SAFEST OF ALL EXPLOSIVES.

TONITE is a most efficient and economical blasting agent, and is largely in demand. It is exempt from freezing and the consequent dangerous process of thawing.

THE COMPANY ALSO MANUFACTURE

GELIGNITE, BLASTING GELATINE, &c.

DETONATORS, Suitable for all Classes of Explosives.

ELECTRIC DETONATORS, High or Low Tension.

ELECTRIC APPLIANCES, of all Descriptions.

SAFETY FUSE.

Address—THE COTTON POWDER COMPANY (Limited),
116, QUEEN VICTORIA STREET, E.C.**IMPROVED Winding Indicators**

WITH INDICATING SIGNAL BELL COMBINED,

As shown in Illustration.

Or either of the two separately as required.

Made to suit any Winding Engine or for hauling purposes; with Bell, to denote when to cut off steam; which can be altered in a few minutes to ring at any part required.

PRICES AND PARTICULARS—

Parkin,

LIVERSEDGE, YORKS.

Watch this Advertisement every other week.

SOLE AGENTS FOR SCOTLAND:

Messrs. ARCHD. BAIRD & SON,

59-61, Waterloo Street, Glasgow.

Export Agent:—MR. STEPHEN HUMBLE, Junr., Emerson Street, Southwark, S.E.

The COUNTY GENTLEMAN'S PAPER for Cheshire, Shropshire, and North Wales is

THE CHESTER COURANT.

(ESTABLISHED 1780.)

The CHESTER COURANT goes into all the best houses and has a Subscription List of remarkable scope and character.

It is a most suitable medium for advertising Patent Machinery used on large Farms or County Estates.

MACARTHUR-FORREST PROCESS.**TO MINE OWNERS AND OTHERS**

Having REFRACTORY GOLD ORES hitherto untreatable at a profit, the MACARTHUR-FORREST (PATENT) PROCESS OF GOLD EXTRACTION offers a solution of the difficulty.

The chief features of this Process are:—

SIMPLICITY, ECONOMY IN WORKING, and SMALL COST of PLANT.

PROPRIETORS:—

The Cassel Gold Extracting Co. (Ltd.)

Head Office—108a, Hope Street, Glasgow.

London Office—23, College Hill, Cannon Street, E.C.

Africa—The African Gold Recovery Co. (Ltd.), Johannesburg.

Australia—The Australian Gold Recovery Co. (Ltd.), 8, Post Office Chambers, Sydney, N.S.W., Charters Towers, Queensland, and Mr. Geo. S. Fowler, J.P., Adelaide.

United States—The Gold and Silver Extraction Co. of America (Ltd.), Denver, Colo.

Mexico—The Mexican Gold and Silver Recovery Co. (Ltd.), 2a, Calle de Providencia, No. 7, Mexico City, Mexico.

Chili—Mr. J. A. W. Murdoch, Calle Almendro, Valparaiso.

New Zealand—The Cassel Gold Extracting Co. (Ltd.), 6, Herald Buildings, Queen Street, Auckland.

Canada—Mr. W. Pellow Harvey, F.C.S., 717 and 719, Pender Street, Vancouver City, British Columbia.

The CASSEL GOLD EXTRACTING Co. (Ltd.) are manufacturers of CYANIDE, suitable for the MacArthur-Forrest Process.

For terms, apply at Head Office of the Company,

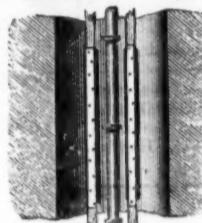
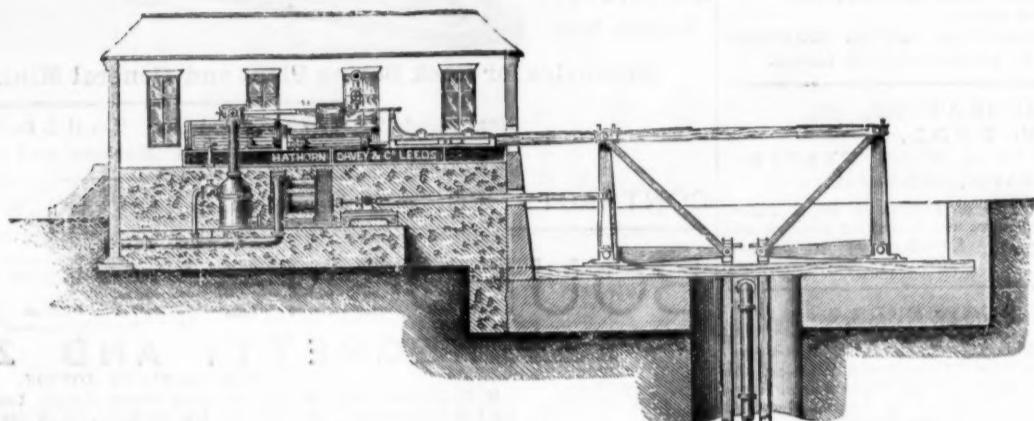
108a, Hope Street, GLASGOW.

HATHORN, DAVEY & CO., LEEDS.

The DAVEY PUMPING ENGINE for DRAINING MINES

Is in use all over the World, and unquestionably has proved itself to be without a rival in SAFE and EFFICIENT WORKING and ECONOMY.

REGISTERED TELEGRAPHIC ADDRESS:



SURFACE ENGINES 10 to 1000 HORSE POWER.

UNDERGROUND ENGINES.

STEAM PUMPS, COMPOUND AND TRIPLE EXPANSION.

Hydraulic Pumps.

DRAINAGE PUMPS. WATER WORKS PLANT. DOCK MACHINERY, CAPSTANS, &c.

CATALOGUES ON APPLICATION.



FIG. 38
EXTERIOR VIEW—Showing Crushing Head.

Manufacturers of Mining Machinery and complete Macadam Plants.

GATES ROCK AND ORE BREAKER.

Capacity in Tons of 2000 Pounds.

Size 0—2 to 4 tons per hour.	Size 3—10 to 20 tons per hour.	Size 6—30 to 60 tons per hour.
" 1—4 to 8 "	" 4—15 to 30 "	" 7—40 to 75 "
" 2—6 to 12 "	" 5—25 to 40 "	" 8—100 to 150 "

Passing $2\frac{1}{2}$ in. ring, according to character and hardness of material.

GREAT SAVING IN POWER. Adjustable to any Degree of Fineness.

The principle involved in this Breaker acknowledged to be the greatest success ever introduced into Stone Breaking machinery.

Send for Catalogue, containing over 500 references of Contractors, Miners, Railways Companies, Cement Makers, etc.

By the use of this machine cubical road metal can be produced at a low cost.

GATES IRON WORKS (A)

73a, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

136, Liberty Street, New York.

WORKS: 650, Elston Avenue, Chicago, U.S.A.

Improved Cornish Rolls & Screens.
COMPLETE CYANIDE PLANTS.

ESTABLISHED 1851

BIRKBECK BANK

SOUTHAMPTON BUILDINGS, CHANCERY LANE, LONDON.
TWO-AND-A-HALF per CENT. INTEREST allowed on DEPOSITS repayable on Demand.

TWO per CENT. on CURRENT ACCOUNTS on the minimum monthly balances, when not drawn below £100.

SAVINGS DEPARTMENT.

For the encouragement of Thrift, the Bank receives small sums on Deposit and allows Interest monthly on each completed £1.

The Birkbeck Almanack, with full particulars, post free.

FRANCIS RAVENSCROFT, Manager.

EL MINERO MEXICANO.

The Mining and Industrial Journal of Mexico.

ESTABLISHED 1873.

Published in the City of Mexico every THURSDAY,

in the Spanish Language.

Taken by Mine Owners, Capitalists, Manufacturers, Merchants, the richest and most liberal people, all over Mexico.

THE BEST ADVERTISING MEDIUM.

MEXICAN PATENT & TRADE MARK AGENCY.

A, Independencia No. 1, City of Mexico.

RICHARD E. CHISM, M.E. Editor and Proprietor.

CABLE MILLS, OLDHAM ROAD, MANCHESTER.

THE FRICTIONLESS ENGINE PACKING CO.

SOLE MAKERS OF LIMITED.

Karmal, Railite, and Metallic Packings.

(OGDEN'S PATENT.)

MANUFACTURERS OF ALL KINDS OF
Engine and Pump Packings, Indiarubber Goods,
rubber Goods, Hair and Cotton Belting.

Highest Awards wherever Exhibited. Send for Price List
and Testimonials.

Telegraphic Cable Address: "PACKLESS, MANCHESTER."

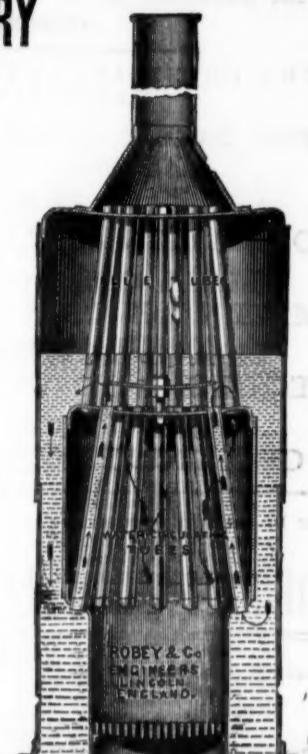
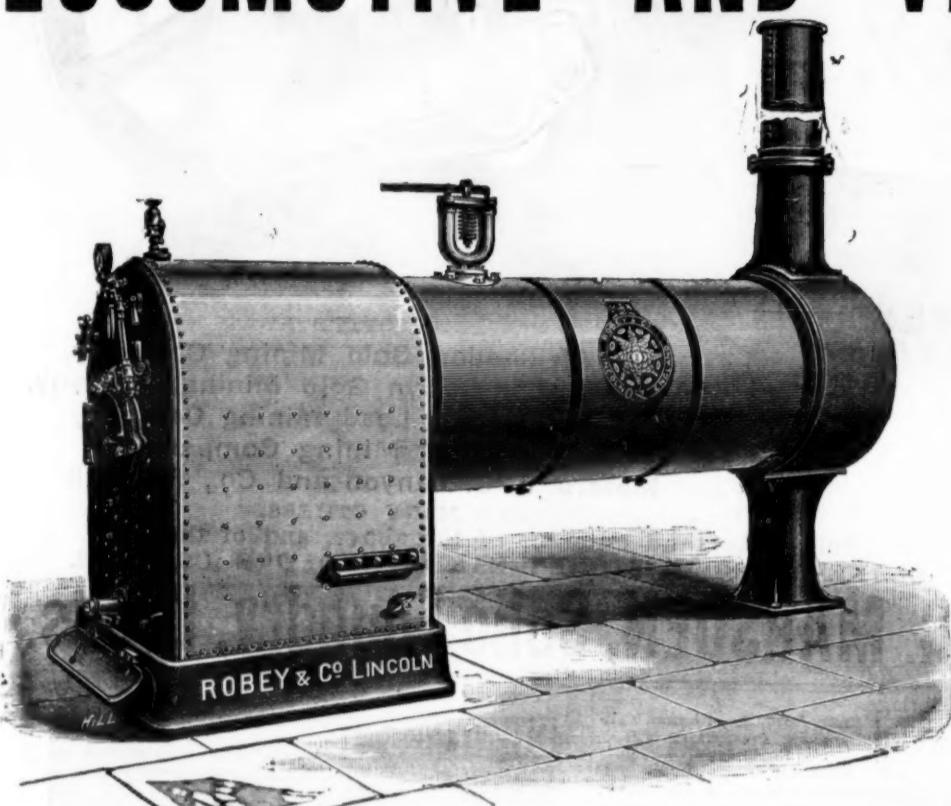


REGISTERED TRADE MARK.

ROBEY & Co., MANUFACTURERS OF LOCOMOTIVE AND VERTICAL BOILERS

LIMITED.

BY SPECIAL MACHINERY

OF PERFECT AND MOST
MODERN
CONSTRUCTION.RIVETTED BY
HYDRAULIC MACHINERY.All Holes Drilled in
Position.Standard Sizes in Stock or
Progress for Quick Delivery.

Also Manufacturers of Portable Engines, Semi-Portable Engines, Robey Engines and Locomotive Boilers combined (both Compound and Simple); Vertical Engines, High-Speed Engines, Horizontal Fixed Engines (Simple and Compound); Sugar Mills, Cornish and Lancashire Boilers, Winding Engines, Head Gears, Mine Pumps, Centrifugal Pumps, Patent Gas and Oil Engines, and every description of Machinery for Builders and Contractors.

GLOBE WORKS, LINCOLN.

SAFETY BLASTING IN COAL AND SHALE, ETC.

SETTLE'S ^{Patent} GELATINE WATER-CARTRIDGE

NOBEL'S EXPLOSIVES COMPANY (Limited), Glasgow, having acquired from Mr. MILES SETTLE the Sole Patent Rights of his Water-Cartridge System of Blasting have now arranged to supply through their local Agents all the Appliances required in connection therewith.

ADVANTAGES OF USING STTLE'S PATENT GELATINE WATER-CARTRIDGE:

1.—SAFETY IN BLASTING. 2.—NO SMOKE. 3.—NO SPARK OR FLAME. 4.—NO FUMES. 5.—ALL COAL GOTTEN IN LUMPY CONDITION AND WITH A MUCH SMALLER PERCENTAGE OF SLACK THAN IN BLASTING WITH POWDER. 6.—GREAT SAVING OF COST OWING TO MORE EFFICIENT BLASTING, AND TO REDUCTION OF MANUAL LABOUR. 7.—SIMPLICITY OF THIS METHOD OF BLASTING.

Trained Experts will carry out experiments, and instruct Colliery Managers, Miners, &c., FREE OF CHARGE, on application to Nobel's Explosives Company (Limited), Glasgow, or to their Consulting Engineer.

The use of the WATER-CARTRIDGE is recommended by the Royal Commission on Accidents in Mines.

For full information apply to NOBEL'S EXPLOSIVES COMPANY (LIMITED), GLASGOW, or to H. ENFIELD TAYLOR, M.Inst.C.E., the Company's Consulting Engineer, 15, Newgate Street, Chester.

MANUFACTURERS OF GELATINE-DYNAMITE, DYNAMITE, DETONATORS, ETC. ETC.

EASTON, ANDERSON, & GOOLDEN, Limited,

Telegrams: EGYPTIAN, LONDON.

Telephone: 3695.

3, WHITEHALL PLACE, LONDON, S.W. ERITH IRON WORKS, ERITH, KENT.
And JOHANNESBURG ... F. W. STOKER, Esq. AUSTRALIA ... MESSRS. HARROLD BROS. TASMANIA ... SALISBURY FOUNDRY CO.

MINING MACHINERY of every description. ELECTRICAL, HAULING, and WINDING PLANTS.

ELECTRICAL PUMPING PLANTS.

ELECTRICAL ROCK DRILLS.

Plants have recently been supplied to the following amongst other Mines:
THE CHAMP D'OR DEEP LEVEL GOLD MINING COMPANY.
THE CASSEL COLLIERY COMPANY.
VILLAGE MAIN BEEF GOLD MINING COMPANY.
THE GOLD FIELDS DEEP.
METROPOLITAN GOLD MINING COMPANY.
MEYER AND CHARLTON GOLD MINING COMPANY.
ROODEPOORT DEEP LEVEL GOLD MINE COMPANY.

MAY CONSOLIDATED GOLD MINING COMPANY.
GEORGE GOCH GOLD MINING COMPANY.
SALISBURY JUBILEE JOINT MILL.
MOODIES GOLD MINING EXPLORATION COMPANY (LIMITED).
WITWATERSRAND GOLD MINING COMPANY.
FERREIRA GOLD MINING COMPANY.
NIGEL GOLD MINE COMPANY.

SOLE MANUFACTURERS OF THE

NIAGARA CRUSHER, PULVERISER, & CONCENTRATOR.

The most Successful MACHINE in the WORLD. A 5-foot QUARTZ MACHINE will do more and better Work than five head of STAMPS. Costs half the Price. Repairs do not exceed 2½ per cent. per annum on first cost. Any Ore, however Refractory, is speedily reduced to a Uniform Power of any desired fineness, while the CONCENTRATOR SEPARATES THE VALUABLE ORE FROM THE MATRIX WITHOUT EXTRA POWER.

For full particulars of the NIAGARA PULVERISER, apply to the

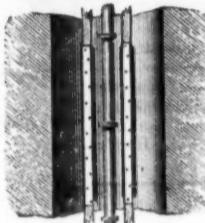
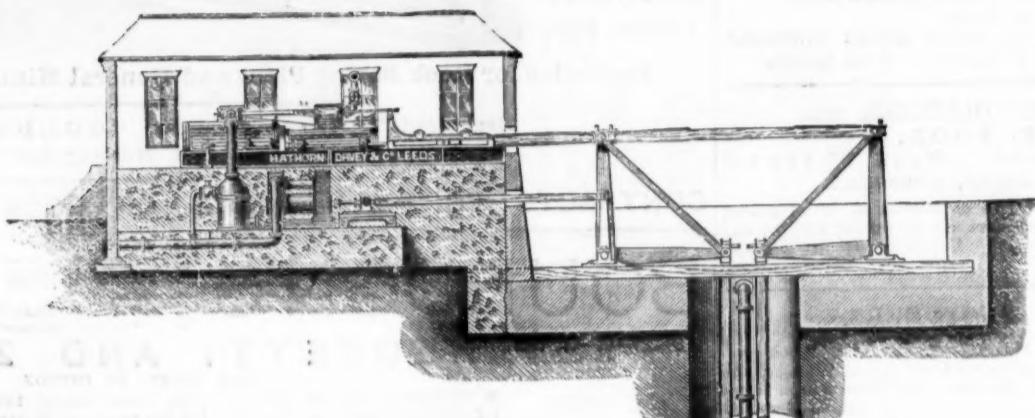
NIAGARA PULVERISER SYNDICATE (LIMITED), 3, WHITEHALL PLACE, S.W.

HATHORN, DAVEY & CO., LEEDS.

The DAVEY PUMPING ENGINE for DRAINING MINES

Is in use all over the World, and unquestionably has proved itself to be without a rival in SAFE and EFFICIENT WORKING and ECONOMY.

REGISTERED TELEGRAPHIC ADDRESS:



SURFACE ENGINES 10 to 1000 HORSE POWER.

UNDERGROUND ENGINES.

STEAM PUMPS, COMPOUND AND TRIPLE EXPANSION.

Hydraulic Pumps.

DRAINAGE PUMPS. WATER WORKS PLANT. DOCK MACHINERY, CAPSTANS, &c.

CATALOGUES ON APPLICATION.



EXTERIOR VIEW—Showing Crushing Head.

Manufacturers of Mining Machinery and complete Macadam Plants.

GATES ROCK AND ORE BREAKER.

Capacity in Tons of 2000 Pounds.

Size 0—2 to 4 tons per hour.	Size 3—10 to 20 tons per hour.	Size 6—30 to 60 tons per hour.
" 1—4 to 8 "	" 4—15 to 30 "	" 7—40 to 75 "
" 2—6 to 12 "	" 5—25 to 40 "	" 8—100 to 150 "

Passing 2½ in. ring, according to character and hardness of material.

GREAT SAVING IN POWER. Adjustable to any Degree of Fineness.

The principle involved in this Breaker acknowledged to be the greatest success ever introduced into Stone Breaking machinery.

Send for Catalogue, containing over 500 references of Contractors, Miners, Railways Companies, Cement Makers, etc.

By the use of this machine cubical road metal can be produced at a low cost.

GATES IRON WORKS (A)

73a, QUEEN VICTORIA STREET, E.C., LONDON, ENGLAND.

138, Liberty Street, New York.

WORKS: 650, Elston Avenue, Chicago, U.S.A.

Improved Cornish Rolls & Screens.
COMPLETE CYANIDE PLANTS.

CABLE MILLS, OLDHAM ROAD, MANCHESTER.

THE FRICTIONLESS ENGINE PACKING CO.

SOLE MAKERS OF LIMITED.
Karmal, Railite, and Metallic Packings.

(OGDEN'S PATENT.)

MANUFACTURERS OF ALL KINDS OF
Engine and Pump Packings, Indiarubber Goods,
and these Goods, Hair and Cotton Belting.

Highest Awards wherever Exhibited. Send for Price List
and Testimonials.

Telegraphic Cable Address: "PACKLESS, MANCHESTER."



REGISTERED TRADE MARK.

ESTABLISHED 1851
BIRKBECK BANK

SOUTHAMPTON BUILDINGS, CHANCERY LANE, LONDON.
TWO-AND-A-HALF per CENT. INTEREST allowed on DEPOSITS repayable
on Demand.

TWO per CENT. on CURRENT ACCOUNTS on the minimum monthly
balances, when not drawn below £100.

SAVINGS DEPARTMENT.
For the encouragement of Thrift, the Bank receives small sums on Deposits
and allows Interest monthly on each completed £1.

The Birkbeck Almanack, with full particulars, post free.

FRANCIS RAVENSCROFT, Manager.

EL MINERO MEXICANO.

The Mining and Industrial Journal of Mexico.

ESTABLISHED 1873.

Published in the City of Mexico every THURSDAY,
in the Spanish Language.

Taken by Mine Owners, Capitalists, Manufacturers, Merchants,
the richest and most liberal people, all over Mexico.

THE BEST ADVERTISING MEDIUM.

MEXICAN PATENT & TRADE MARK AGENCY.

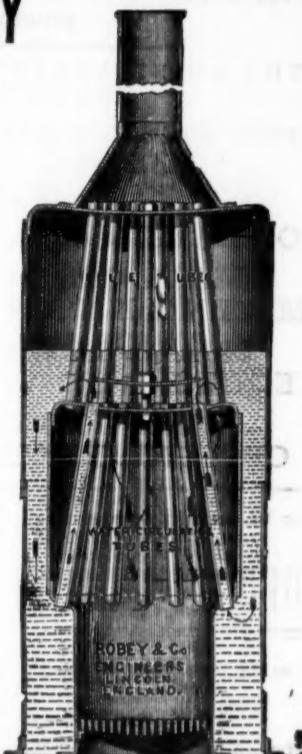
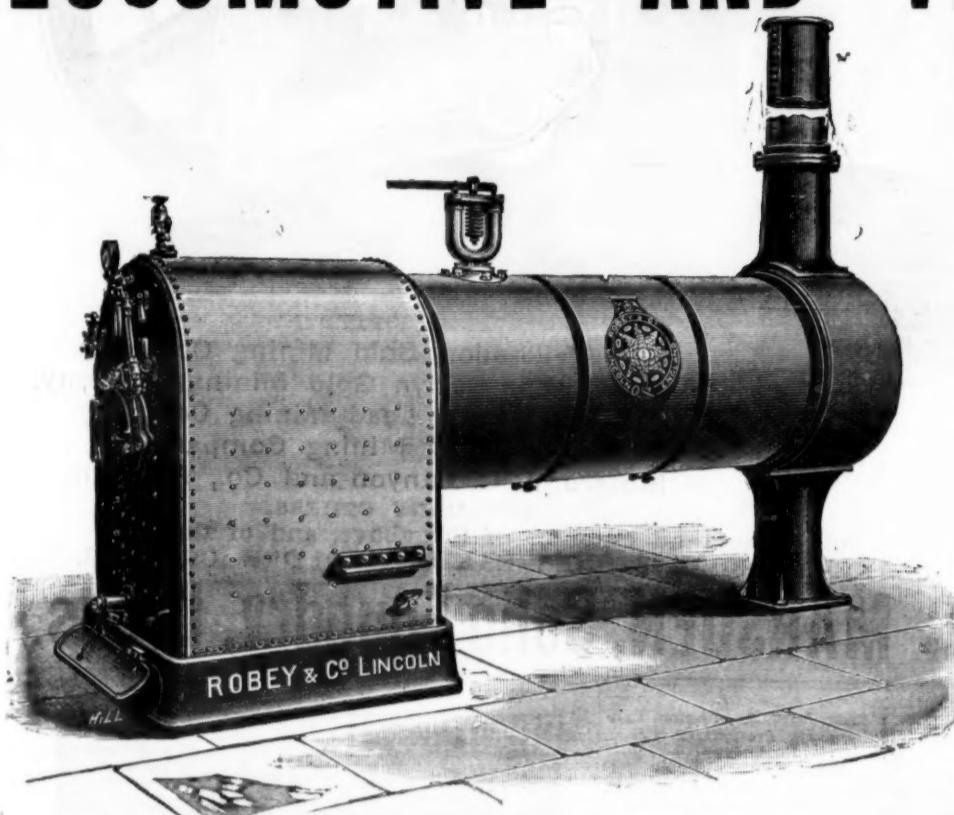
A. Independencia No. 1, City of Mexico.

RICHARD E. CHISM, M.E., Editor and Proprietor.

ROBEY & Co., MANUFACTURERS OF LOCOMOTIVE AND VERTICAL BOILERS

LIMITED.

BY SPECIAL MACHINERY

OF PERFECT AND MOST
MODERN
CONSTRUCTION.RIVETTED BY
HYDRAULIC MACHINERY.All Holes Drilled in
Position.Standard Sizes in Stock or
Progress for Quick Delivery.

Also Manufacturers of Portable Engines, Semi-Portable Engines, Robey Engines and Locomotive Boilers combined (both Compound and Simple); Vertical Engines, High-Speed Engines, Horizontal Fixed Engines (Simple and Compound); Sugar Mills, Cornish and Lancashire Boilers, Winding Engines, Head Gears, Mine Pumps, Centrifugal Pumps, Patent Gas and Oil Engines, and every description of Machinery for Builders and Contractors.

GLOBE WORKS, LINCOLN.

SAFETY BLASTING IN COAL AND SHALE, ETC.

SETTLE'S ^{Patent} GELATINE WATER-CARTRIDGE

NOBEL'S EXPLOSIVES COMPANY (Limited), Glasgow, having acquired from Mr. MILES SETTLE the Sole Patent Rights of his Water-Cartridge System of Blasting have now arranged to supply through their local Agents all the Appliances required in connection therewith.

ADVANTAGES OF USING STTLE'S PATENT GELATINE WATER-CARTRIDGE:

1.—SAFETY IN BLASTING. 2.—NO SMOKE. 3.—NO SPARK OR FLAME. 4.—NO FUMES. 5.—ALL COAL GOTTERN IN LUMPY CONDITION AND WITH A MUCH SMALLER PERCENTAGE OF SLACK THAN IN BLASTING WITH POWDER. 6.—GREAT SAVING OF COST OWING TO MORE EFFICIENT BLASTING, AND TO REDUCTION OF MANUAL LABOUR. 7.—SIMPLICITY OF THIS METHOD OF BLASTING.

Trained Experts will carry out experiments, and instruct Colliery Managers, Miners, &c., FREE OF CHARGE, on application to Nobel's Explosives Company (Limited), Glasgow, or to their Consulting Engineer.

The use of the WATER-CARTRIDGE is recommended by the Royal Commission on Accidents in Mines.
For full information apply to NOBEL'S EXPLOSIVES COMPANY (LIMITED), GLASGOW, or to H. ENFIELD TAYLOR, M.Inst.C.E., the Company's Consulting Engineer, 15, Newgate Street, Chester.

MANUFACTURERS OF GELATINE-DYNAMITE, DYNAMITE, DETONATORS, ETC. ETC.

EASTON, ANDERSON, & GOOLDEN, Limited,

Telegrams: EGYPTIAN, LONDON.

Telephone: 3695.

3, WHITEHALL PLACE, LONDON, S.W. ERITH IRON WORKS, ERITH, KENT.
And JOHANNESBURG ... F. W. STOKER, Esq. AUSTRALIA ... Messrs. HARROLD BROS. TASMANIA ... SALISBURY FOUNDRY CO.

MINING MACHINERY of every description. ELECTRICAL, HAULING, and WINDING PLANTS.

ELECTRICAL PUMPING PLANTS. ELECTRICAL ROCK DRILLS.

Plants have recently been supplied to the following amongst other Mines:—
THE CHAMP D'OR DEEP LEVEL GOLD MINING COMPANY.
THE CASSEL COLLIERY COMPANY.
VILLAGE MAIN REEF GOLD MINING COMPANY.
THE GOLD FIELDS DEEP.
METROPOLITAN GOLD MINING COMPANY.
MEYER AND CHARLTON GOLD MINING COMPANY.
ROODEPOORT DEEP LEVEL GOLD MINE COMPANY.

MAY CONSOLIDATED GOLD MINING COMPANY.
GEORGE GOCH GOLD MINING COMPANY.
SALISBURY JUBILEE JOINT MILL.
MOODIES GOLD MINING EXPLORATION COMPANY (LIMITED).
WITWATERSRAND GOLD MINING COMPANY.
FERREIRA GOLD MINING COMPANY.
NIGEL GOLD MINE COMPANY.

SOLE MANUFACTURERS OF THE

NIAGARA CRUSHER, PULVERISER, & CONCENTRATOR.

The most Successful MACHINE in the WORLD. A 5-foot QUARTZ MACHINE will do more and better Work than five head of STAMPS, Costs half the Price. Repairs do not exceed 2½ per cent. per annum on first cost. Any Ore, however Refractory, is speedily reduced to a Uniform Power of any desired fineness, while the CONCENTRATOR SEPARATES THE VALUABLE ORE FROM THE MATRIX WITHOUT EXTRA POWER.

For full particulars of the NIAGARA PULVERISER, apply to the

NIAGARA PULVERISER SYNDICATE (LIMITED), 3, WHITEHALL PLACE, S.W.

MARSDEN'S PATENT DRY CRUSHER AND PULVERIZER.

Specially applicable for use in connection with the
CYANIDE PROCESS.

Will Crush to any Degree of Fineness required, and
in connection with the

Blake-Marsden Stonebreaker and Ore Crusher,

is far superior to Rolls, and is the most economical and
efficient Plant extant.

THE CHIEF ADVANTAGES OF THIS SYSTEM OF
REDUCTION CONSIST IN

Great Saving in first Cost
of Plant.

Avoidance of the
FORMATION of SLIMES.

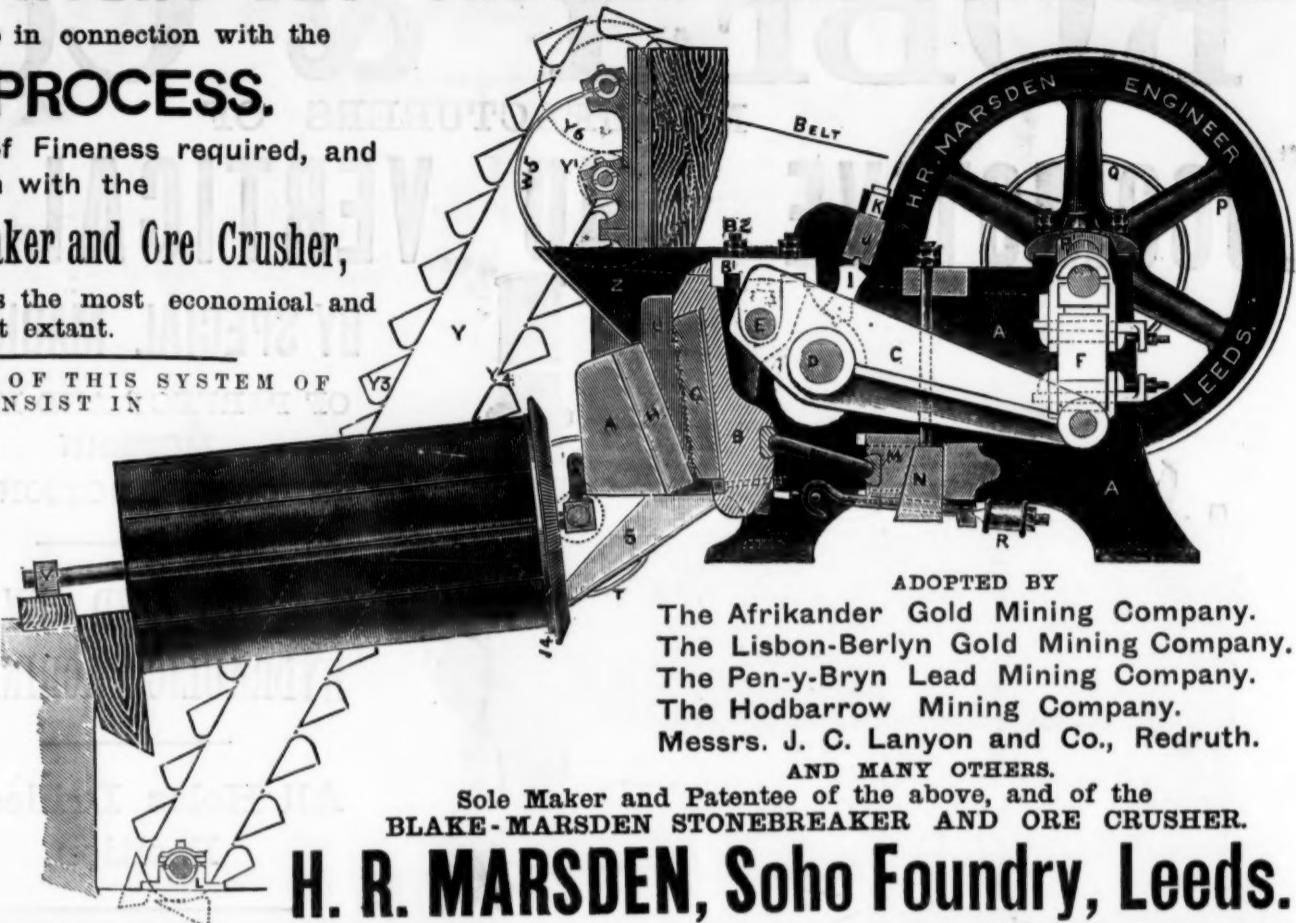
**SMALL COST OF
MAINTENANCE.**

**SMALL POWER
REQUIRED TO DRIVE.**

**SIMPLICITY
OF CONSTRUCTION.**

Can be seen in Operation by appointment at the Works,

SOHO FOUNDRY LEEDS.



ADOPTED BY

The Afrikander Gold Mining Company.
The Lisbon-Berlyn Gold Mining Company.
The Pen-y-Bryn Lead Mining Company.
The Hodbarrow Mining Company.
Messrs. J. C. Lanyon and Co., Redruth.

AND MANY OTHERS.

Sole Maker and Patentee of the above, and of the
BLAKE-MARSDEN STONEBREAKER AND ORE CRUSHER.

H. R. MARSDEN, Soho Foundry, Leeds.

From His Grace the Duke of Rutland.

Belvoir, Grantham,
December 1st, 1879.

SIRS.—Elliman's Royal Embrocation is used in my stables; think it very useful.

RUTLAND.

Master of the Belvoir Hounds.

From the Earl of Harrington.

January 9th, 1889.

SIRS.—Elliman's Royal Embrocation is used in my stables, and I consider it the best that I can obtain.

HARRINGTON.

Master of the South Wilts Hounds.

From Major M. J. Balfe,
South Park.

June 16th, 1892.

SIRS.—Elliman's Royal Embrocation is used in my stables, and I can highly recommend it.

M. J. BALFE.

Master of the Rosscommon County Staghounds.



From Lord Haddington, Tynningham, Prestonkirk, N.B.
December 27th, 1885.

SIRS.—Elliman's Royal Embrocation is used in my stables, and I consider it indispensable in any stable, but especially in the stable of a Master of Hounds.

HADDINGTON.

Master of the Berwickshire Hounds.

From R. Burdon Sanderson, Esq., Warren House, Belford.

July 10th, 1892.

SIRS.—Elliman's Royal Embrocation is used in my stables and I consider it very useful.

R. BURDON SANDERSON.

Master of Percy Foxhounds.

From Wm. J. Buckley, Esq., Penyfa, Llanelli.

July 16th, 1892.

DEAR SIRS.—I have much pleasure in recommending your Royal Embrocation. I always keep a stock in my stables and kennels. My farm bailiff has also found it of much value among my herd.

W.M. BUCKLEY.

Master of Carmarthenshire Foxhounds.

CHARLES HANSELL & CO.

CANAL AND MONTGOMERY STEEL WORKS.

CADMAN ST. SUSSEX ST.

SHEDFIELD.

SPECIAL TOUGH BORER STEEL

STEEL MINING WHEELS AND AXLES, ROLLERS, PULLEYS, HAMMERS, SCREEN BARS, SAWs AND FILES.

A SPECIALTY IN MINERS DRILL AND JUMPER STEEL WEDGES AND HAMMERS.

FONTAINE CO.,
PERFORATING WORKS, AIX-LA-CHAPELLE, GERMANY.

(ESTABLISHED 1857.)



PERFORATED PLATES FOR Sieving and Sorting purposes, round, square, and taper holes. Separation and Cleaning of Grain. Drying Hops, Tobacco, Chicory, Bones, Manures. Beer-weries, Chemical Works, Cement Works, Corn Mills, &c. Specialties for Sugar Manufacturers. Copper Sheets perforated with our elongated Conical Holes. Filterpress Plates, &c.

PRICES ON APPLICATION.

BRUNTON and PEARSE'S PATENT POCKET MINE TRANSIT.

In Aluminium and Silver. Price £5 post free to any part of the United Kingdom or the Colonies.

For circular and particulars apply to

ARTHUR L. PEARSE,

7, ST. MILDRED'S COURT, POULTRY, LONDON

DELTA METAL
FOR ALL ENGINEERING WORK.
STRONGER AND MORE DURABLE THAN STEEL.
Specially Adapted for MINING WORK
on account of its very high Resistance to Corrosion.



CAST, FORGED, STAMPED, ROLLED, DRAWN.
For full Particulars and Prices apply to
THE DELTA METAL COMPANY (Ltd.)
110, Cannon Street, London, E.C.
Telegrams:—"DELTA," London. Telephone No. 11292.

TELEGRAMS: TUCKS LONDON.



GENUINE PACKING

IS ONLY MANUFACTURED BY

TUCK AND CO., LIMITED,
116, CANNON STREET, LONDON;

And at LIVERPOOL, CARDIFF, NEWPORT, BARRY,
SOUTHAMPTON, DUBLIN & MELBOURNE.

WRITE FOR
SAMPLES &
PRICE

INDIARUBBER, LEATHER, AND ASBESTOS GOODS.

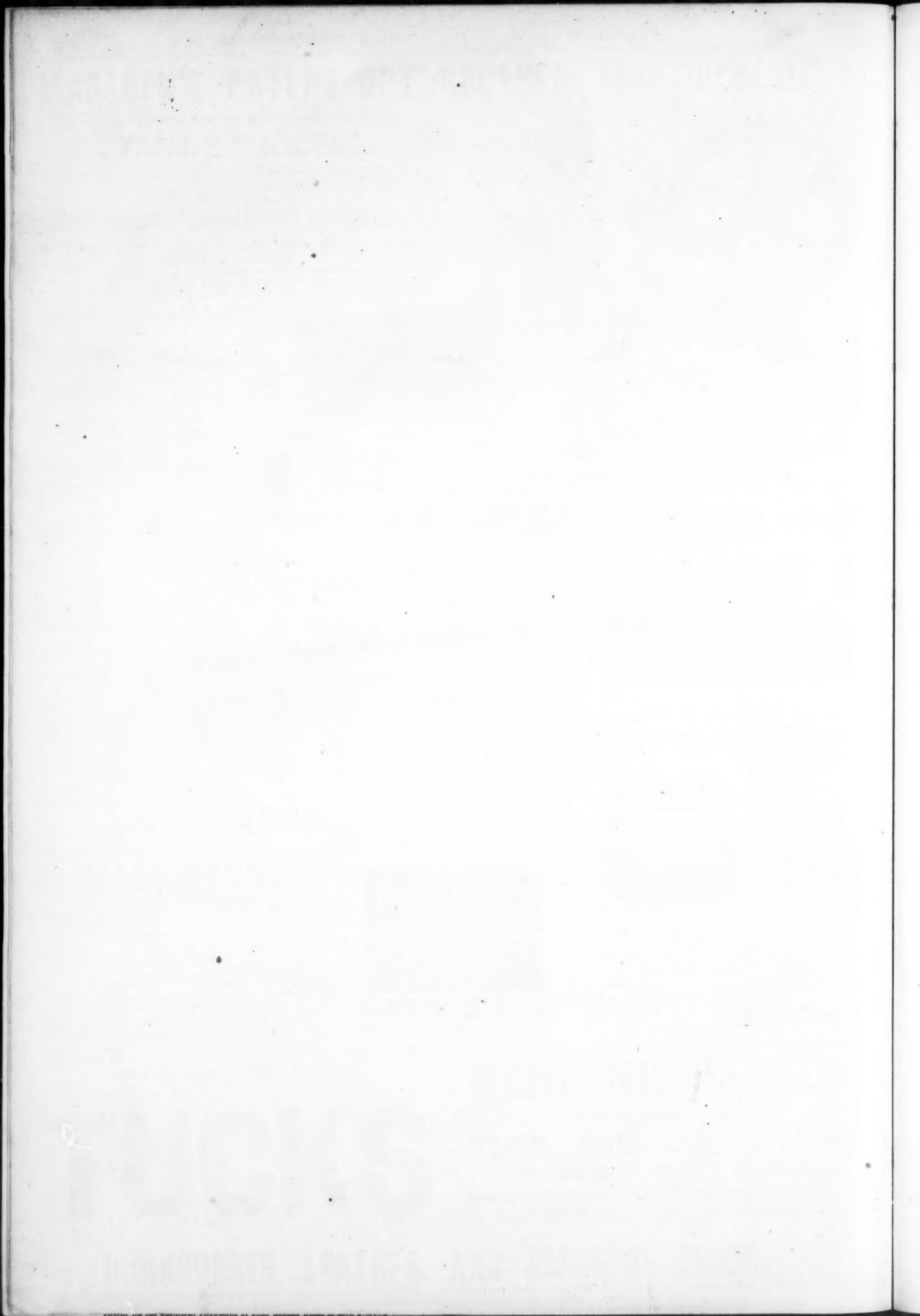
Editorial and Advertisement Offices:—18, FINCH LANE, E.C.
Printed for the Proprietors by JOHN ROBERT GALE, at their Printing Office, 5, DESMOND BUILDING, SALISBURY SQUARE, in the Parish of St. Bride's, in the City of London.—June 27, 1896.

Y.
tr.
nd
of
o.
al
rn
nu-
ed
ca?
So.

T

ost

—
D,
9



NOTE

This volume has a very
tight binding and while every
effort has been made to repro-
duce the centres, force would
result in damage